DECEMBER 1991

OPPORTUNITIES FOR IS TRAINING IN WESTERN EUROPE

1991-1996

INPUT®

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Market Analysis Programme - Europe

Opportunities for IS Training in Western Europe, 1991-1996

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Abstract

This study provides an analysis of the Western European market for information services training. Contained within the study is a five year market forecast covering the period 1991 to 1996.

The study identifies and discusses the key trends and opportunities for vendors in the European information services training market and also identifies the key issues and challenges facing vendors in this market.

Changing user needs for training and delivery modes are identified and discussed, both medium and long term trends.

Additionally the study provides market forecasts for thirteen individual country markets in Western Europe, covering the period 1991 to 1996, segmented by vendor as follows:

- Equipment vendors
- Independent software and services vendors

Profiles on the training activities of eight selected vendors are provided.

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I

Introduction

I Introduction

This study has been produced by INPUT as part of the 1991 Market Analysis Programme - Europe.

A
Objectives

The primary objectives of this study are to analyse the market for information services training in Western Europe and to identify the key opportunities and challenges facing training vendors.

Additional objectives are to:

- Provide individual market forecasts for the major country markets in Western Europe
- Identify emmerging trends in training delivery from the perspective of user needs and vendor activities
- Identify the training revenues of leading vendors
- Provide profiles of the activities of a selection of leading vendors.

B
Scope

This study assesses the entire market in Western Europe for information services training. Market forecasts are provided for thirteen country markets segmented by vendor type as follows:-

- Equipment Vendors
- Independent Software and Services Vendors

Market forecasts cover the period 1991 to 1996.

C
Methodology

Field research for this study was conducted between May and July 1991.

Data contained within this study were obtained during telephone interviews with fifteen training vendors. Data were also obtained from INPUT's ongoing programme of vendor research, access to INPUT's library and public domain information.

D
Report Structure

The remaining research papers that comprise this study are organised as follows:

Chapter II is an executive overview providing a concise summary of the whole study.

Chapter III provides a definition of the market structure and delivery modes.

Chapter IV contains a market forecast for Western Europe and thirteen country markets in Western Europe. These forecasts are expressed in local currency, US dollars and ECU's.

Chapter V provides identification and discussion of the key trends and opportunities for training vendors.

Chapter VI identifies and discusses the key issues and challenges facing training vendors.

Chapter VII contains eight profiles on a selection of training vendors.

Appendix A is a database providing a year on year detailed market forecast for thirteen country markets, expressed in local currency.

Appendix B reconciles INPUT's 1990 and 1991 market forecasts for the Western European information services training market.

Appendix C contains the currency conversion rates and economic assumptions used in the compilation of this study.

Appendix D contains INPUT's definition of terms used in this report.

II

Executive Overview

II Executive Overview

A
Information Services Training Market Poised for Innovation and Change as Recession Impacts Growth.

Economic recession in Western Europe is a primary factor responsible for reduced growth of the information services training market. This market is now forecast to grow at 14% per annum over the next five years to reach over $5 billion by 1996.

Previous forecasts indicated that the information services training market would grow at an estimated 21% compound annual growth rate (CAGR) over the period 1990 to 1995. However, the onset of sharp recession in Western Europe towards the end of 1990 is causing users to review all items of company expenditure including that for information services and technology. As a consequence of reduced user expenditure, growth of the information services training market is forecast to reduce to about 14% CAGR over the period 1991 to 1996.

Factors that contribute to the recessionary reduction in growth of the information services training market are:-

- Reduced inflation.
- Reduced growth of the professional services market, of which training is a part.
- Overreaction to recession by users in reducing training expenditure.

The key findings that emerge from this study are listed in Exhibit II-1.

Exhibit II-1

Key Findings

- Recession in computer systems market depresses growth of training
- Polarisation of User Training Needs
- Implementation of Workplace Training
- Introduction of Technology based Training Solutions

In many user organisations the onset of market recession often results in the training budget being the first item of user costs to be reduced. This reaction to recession by users is one of the primary factors responsible for a relatively sharp decline in growth of the training market. A decline in growth that is more pronounced than that experienced by other sectors of the information services market.

Technology trends are projected to produce a polarisation in user needs for information services training. For example:-

- Users are likely to require a smaller number of more highly qualified technical staff. The job functions currently undertaken by less qualified technical staff will be progressively replaced by the application of software tools.
- As the decentralisation trend of computer operations continues, user organisations will seek an increasing number of end users highly skilled in the use of information systems.

The cost and disruption to productivity caused by off-site training is expected to cause a significant trend in changing the methods by which training is delivered. The implementation of workplace training, through the medium of technology based training products or application embedded training modules, will form the basis of a change in training delivery modes.

New training technology is currently poised to make an impact on the information services training market. Companies such as Applied Learning are already marketing technology based training products and this company is currently achieving revenues of about $45 million in Western Europe from this activity. Other examples include the potential for the use of satellite communications as a training delivery vehicle, as demonstrated by EuroPACE who currently deliver over 350 hours of training each year using this delivery method. The potential for the use of ISDN as a training vehicle should not be underestimated.

B
Information Services Training Market in Western Europe, 1991 to 1996

1. Market Drivers and Inhibitors

The primary factors that are driving or inhibiting the growth of information services training in Western Europe are illustrated in Exhibit II-2.

Factors driving the market growth include:

- One of the effects of economic recession is to cause companies to seek ways to reduce internal costs. One result of this activity is for companies to outsource services that were previously provided by in-house resources
- The decentralisation of computer operations to the departmental level and the growth of desktop technology is creating an increasing need for the development of end user skills in the provision of business information
- Even though the implementation of new systems by users is being slowed by economic recession, each new system implementation creates a training need.

Factors inhibiting growth of the information services training market include:-

- The current recession in the information services market is depressing growth in all market sectors. As user training budgets are often the first item to be subject to reduction growth of the training market is likely to be depressed more than other market sectors.
- Use of user in-house resources to undertake training activities establishes a portion of the market that is not readily open to competitive bids. However, user outsourcing trends are tending to create opportunities for vendors in this previously closed portion of the market.
- In situations where training costs are bundled, as an integral part of an overall system project contract, user expenditure for training is not separately identified. Therefore, this activity removes a portion of the market open to competitive bids. As the information services market becomes more competitive this trend of cost bundling could increase, as vendors seek to improve the competitiveness of their products.

2. Market Growth

Exhibit II-3 provides a forecast for the growth of user expenditure for information services training in Western Europe for the five year period 1991 to 1996.

Previous growth forecasts for the period 1990 to 1995 indicated a growth of about 21% CAGR. Mainly as a result of the recessionary forces the projected growth for the period 1991 to 1996 has been reduced to about 14% CAGR. The basis on which this reduced growth forecast is justified is:

- The inflation content has been reduced by about 1.5%
- Recessionary pressures within the computer industry are estimated to have reduced the growth of professional services sector, of which training forms a part, by about 2.5% in real terms
- Overreaction by users in reducing training budgets is estimated to account for about an additional 2% growth reduction.

3. Country Market Growth

The growth projected for the information services training market in the four larger country markets in Western Europe is indicated by Exhibit II-4.

France, Germany, United Kingdom and Italy account for almost 75% of total user expenditure for information services training in Western Europe in 1991.

Those markets worst affected by inflationary effects are those in France and the United Kingdom. In the United Kingdom the market outlook is relatively unhealthy, growth in this market is anticipated to remain relatively low up to 1993/94 at which time the market growth is expected to improve as the economy recovers.

Growth in the German market is aided by a relatively stable economy, less effected by recessionary pressures than in other countries.

4. Market Sector Growth

Exhibit II-5 provides a forecast for growth of the information services training market in Western Europe segmented by vendor type.

The larger share of the information services training market is held by the independent software and services vendors, who currently command a 58% market share. The higher growth rate forecast for training services provided by these vendors will result in their achieving an increased market share of over 60% by 1996.

Exhibit II-2

Information Services Training Market in Western Europe Market Drivers and Inhibitors

Drivers

- User outsourcing
- Computer operations decentralisation
- New system needs

Inhibitors

- IS market recession
- User in-house training
- Cost bundling

Exhibit II-3

Information Services Training Market in Western Europe Market Growth, 1991-1996

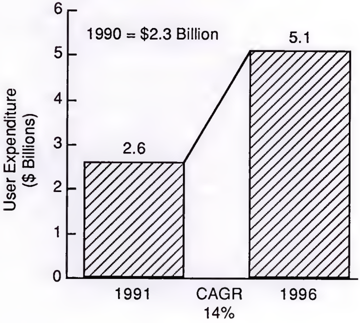


Exhibit II-4

Information Services Training Market in Western Europe Country Market Growth, 1991-1996

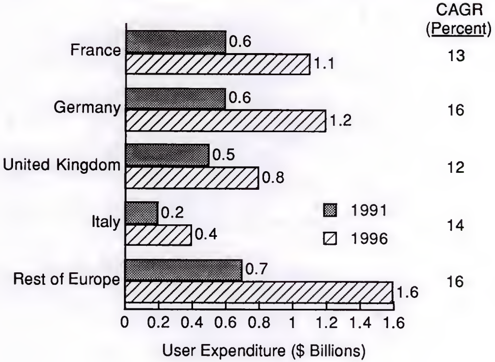
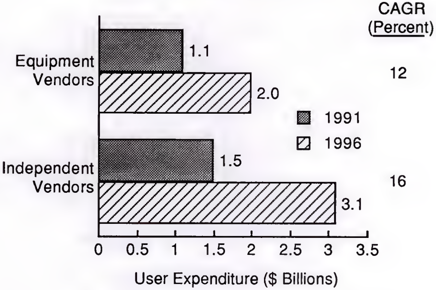


Exhibit II-5

Information Services Training Market in Western Europe Vendor Sector Growth, 1991-1996



1990 = Equipment Vendors $1.0 Billion
= Independent Vendors $1.3 Billion

5. Leading Vendor Revenues

Exhibits II-6 and II-7 provide estimates of the information services training revenues of the leading vendors in Western Europe.

Exhibit II-6 provides revenue estimates for the leading independent software and services vendors and Exhibit II-7 those of the leading equipment vendors.

Two major characteristics differentiate between each type of vendor.

- The independent software and services vendor sector of the market is estimated at almost $1.3 billion in 1990. The fragmented nature of this market sector is highlighted by the leading five vendors commanding only about a 15% share.
- The relatively dominant position held by the leading equipment vendors. The leading five equipment vendors commanded a market share of about 55% in their market sector, which was estimated at almost $1.0 billion in 1990.

Exhibit II-6

Information Services Training Market in Western Europe Leading Independent Vendor Training Revenues - 1990

VENDOR	1990 Revenues ($ Millions)	Sector Market Share (Percent)
CGS	100	8.0
Applied Learning	45	3.5
Learning Tree	28	2.0
Sphinx-Level V	20	1.5
Integrata	14	1.0

Independent Vendor Market Sector 1990 = $1,280 Million

Exhibit II-7

Information Services Training Market in Western Europe
Leading Equipment Vendor Training Revenues - 1990

VENDOR	1990 Revenues ($ Millions)	Sector Market Share (Percent)
IBM	155	16.0
Digital	145	15.0
NCR	105	11.0
Bull	70	7.0
Unisys	65	6.5

Equipment vendor market sector 1990 = $980 million

C
Future Training Opportunities and Trends in the Information Services Market

1. User Needs Polarising

User needs for computer operational skills and hence future training requirements are projected to become more polarised. The direction of this polarisation and the opportunities that will be created for training vendors is illustrated by Exhibit II-8.

In assessing the future need for user technical skills the following trends are projected:

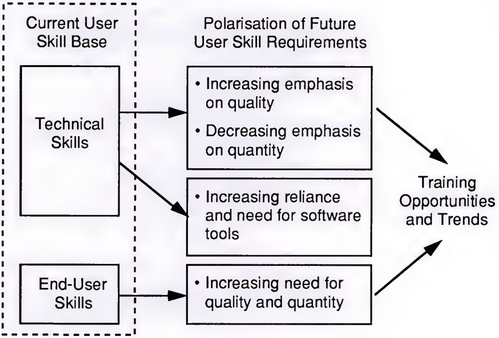
- As the capability of software tools improves user requirements for the lower levels of technical skills will decrease. Tasks undertaken by lower skilled technical staff will be replaced by software tools and user training needs in this area will be de-emphasised.

- As the implementation of software tools increases users will require a reduced number of much more highly skilled technical staff to undertake tasks at the detailed microcode level. This requirement for highly skilled technical staff will provide an opportunity for training vendors.

Company organisational needs are progressively moving towards a requirement for business information, rather than for data. The impact of this trend will create an increasing need for end user skills, in terms of both quality of skills and the number of staff required. This area will also present an opportunity for training vendors, however it should be noted that the end user market is relatively fragmented and therefore more difficult to access than more centralised organisations. Therefore vendor strategies for accessing this market are key if successful penetration is to be achieved.

Exhibit II-8

Information Services Training Market in Western Europe Future Polarisation of User Needs


Current User Skill Base
Polarisation of Future User Skill Requirements
Technical Skills
End-User Skills
• Increasing emphasis on quality
• Decreasing emphasis on quantity
• Increasing reliance and need for software tools
• Increasing need for quality and quantity
Training Opportunities and Trends

2. Changing Delivery Modes

The method by which training is delivered is projected to change. Exhibit II-9 illustrates the likely trend of training delivery changing from being primarily an off-site activity to a function that is performed mainly in the workplace.

The major driving force behind these changes is the high cost, to the user, of off-site training. This cost relates not only to the training course but also to the loss of efficiency and productivity that is caused to the user by prolonged periods of staff absence. Typically a $2,000 one week training course can cost the user up to $10,000 when hidden costs are taken into account.

Therefore, the potential cost savings to the user that result from a change of delivery mode from off-site to workplace training are considerable.

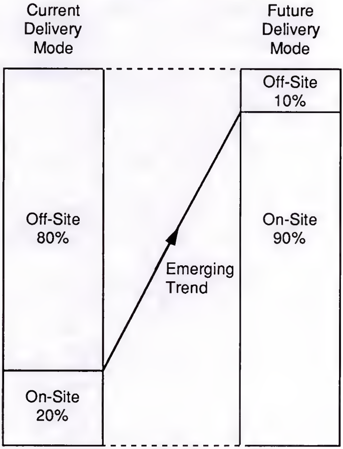
Vendors who have developed alternative solutions to off-site training should be well placed to take advantage of this trend in user training requirements.

As a consequence of the change from off-site to workplace training the role of the trainer will change from being a delivery mode to that of a provider.

The key to the success of workplace training lies with training technology.

Exhibit II-9

Information Services Training Market in Western Europe Changing Delivery Modes



3. Emerging Technology

In order to fulfil user requirements for workplace rather than off-site training, vendors will need to develop suitable training technology and delivery vehicles.

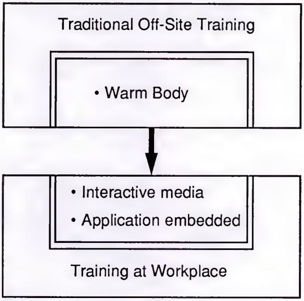
Exhibit II-10 identifies the key elements of change required to effect a shift from off-site training to workplace training.

The major change required to achieve this transition to workplace training is the substitution of the traditional "warm body" approach with a suitable technology-based solution. Three potential solutions are:

- Interactive media; the use of video tape or CD-ROM to provide training via a terminal at the workplace. This approach has been implemented by Applied Learning and at the present time is achieving a degree of success in that the company achieves revenues of about $45 million in Western Europe.
- The implementation of application embedded training modules to provide operators with on-line access to training and support documentation. There is further potential in this aspect of training technology to provide for the simulation of "live" operating conditions. This approach to training is to a degree being provided, for example, by Microsoft in their implementation of Windows.
- The use of satellite communications as a training delivery mode offers the potential improving the delivery efficiency of training, as demonstrated by EuroPACE. The implementation of ISDN as a training delivery vehicle also has potential to achieve the aims of improved training efficiency.

Exhibit II-10

Information Services Training Market in Western Europe Emerging Technology



4. The Timing of Change

The time period over which the future trends in the training market (polarisation of user needs, implementation of workplace training and the successful introduction of new technology) will have effect is more difficult to predict. However, the following suggested indications are offered:

- In the medium term, say five years, it is anticipated that:-
    - A measurable shift towards the introduction of workplace training will be achieved.
    - Technology based training solutions will have become an accepted alternative to current "warm body" methods.
    - The implementation of software tools will begin to reduce user needs for lower level technical skills.
- One factor of key importance is however a need to improve the level of interaction possible through the medium of technology based training solutions, if these are to fully substitute for the "warm body" approach. It is anticipated that changes to improve the level of interaction will occur to enable the medium term changes to take place, but that it could take up to 15 years to provide a fully interactive solution.

III

Market Structure and Delivery Modes

III Market Structure and Delivery Modes

A
Introduction

This section contains the definition of the information services training market as forecast by **INPUT** and outlines the scope of training available for delivery to users.

Revenue streams are defined and a distinction between education and training provided.

Although the market forecast by **INPUT** is restricted to user expenditure for training provided by commercial vendors an assessment of the total training market is provided.

B
Definitions

1. Market and Forecast Definition

INPUT's definition of the computer training market and the portion of this market which is measured and forecast is illustrated by Exhibit III-1

Exhibit III-1 illustrates two key factors. Firstly, that the training market forecast by INPUT relates to user expenditure with commercial vendors. INPUT's forecast excludes user costs related to training provided by user in-house resources and excludes elements of training provided by institutional Education bodies. Exhibit III-1 also highlights the demarcation that INPUT makes between training and education, this demarcation can be described as follows:

- Training is specifically job related and usually occurs outside the traditional educational curriculum.
- Education is vocational and is usually related to an overall curriculum of studies.

Training tends to be primarily carried out by commercial vendors, or user in-house organisations, and is highly focused towards job and company requirements for running computer operations.

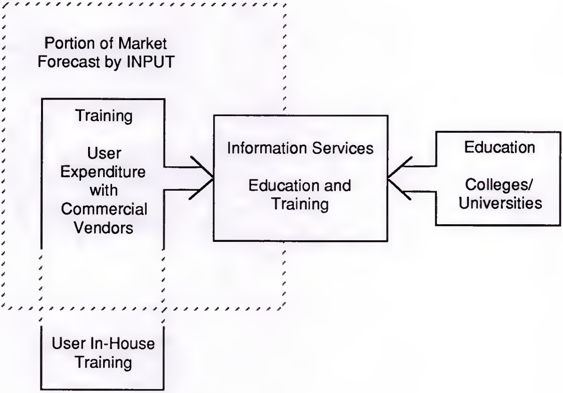
Education tends to be broad based but is highly focused towards achieving academic standards. Any parts of an educational curriculum that relate to the acquisition of computer skills tend to be a means to an end rather that the end itself. For example, a degree of computer skills will be required by students for analysis of engineering or scientific data, however the analysis of the data is the primary consideration.

The part of the computer training market measured and forecast by **INPUT** and that which is the subject of this study, is separately identifyable user expenditure with commercial vendors.

Costs associated with user in-house training are excluded from the forecasts contained within this study, as are the activities of educational institutions.

Exhibit III-1

Information Services Training Market and Forecast Definition



2. Market Positioning

Exhibit III-2 illustrates the origins of user training requirements within the context of computer operational requirements, those requirements for operating the system platform and those for operating user applications. This exhibit identifies the two primary markets that provide for delivery of service to either the systems platform or to satisfy the needs of user applications and the sub-sector in each of those markets that provides training services. Within this exhibit is also a list of the essential elements of computer system training.

Computer systems can be divided into two parts, user applications and the system platform that supports these applications. In turn these two parts of the computer system creates two service markets as follows:

- The information services markets and industry structure is illustrated by Exhibit III-3. Services provided in this market tend primarily to be aimed at addressing the needs of user applications. The primary delivery channel for training within the information services market is via the professional services sector, although all individual sectors of this market contain a training component.
- The customer services market structure is illustrated by Exhibit III-4. This service market is specifically concerned with providing services that support the system platform. Exhibit III-4 identifies the market sector which provides training services.

Training provided within the computer industry covers the whole range of operational skills from executive awareness to machine-code programming.

C
Market Structure

1. Revenue Streams

Exhibit III-5 illustrates the structure of the information services training market. This structure is defined in four ways:

- **The method by which training is paid for, or funded.**
- The revenue streams that comprise the total market and the category of vendor providing the training.
- The objective of the training activity
- The portion of the market that is measured by **INPUT**.

Three revenue streams are identified by Exhibit III-5 which are the result of user expenditure for training services as a separately paid for item:

- Equipment vendors and independent training companies who accrue training revenues as a primary source of income and whose training operations generally operate as a profit centre.
- Software and services vendors who tend to view training as a secondary source of income and whose training operations are not necessarily treated as a separate profit centre.

One revenue stream identified by Exhibit III-5 relates to bundled training revenues. These are revenues that accrue as a result of training being embedded as an integral part of project contracts, rather than being paid for individually. In these cases training is provided in support of project contracts, for example a systems integration project where training is not charged for separately or even separated out for accounting purposes.

The fifth revenue stream identified by Exhibit III-5 is not strictly speaking a true revenue stream, it represents training that is carried out in house by users and is funded from internal budgets. This portion of the market is labelled captive as the training provided is primarily in support of the users applications.

In forecasting growth of the information services training market **INPUT** measures and forecasts the growth of user expenditure, as highlighted by the area enclosed by dotted lines.

The portion of the market defined as education, colleges/universities, is not measured by **INPUT**. However, Exhibit III-6 has been included in the interests of completeness as the education portion of the market is part of the total. The method of representation used in this exhibit is similar to that used in Exhibit III-5. The funding of information services education occurs in three primary ways:

- Short courses run by colleges/universities that are charged for as a separate item and therefore would count as separate revenue.
- Bundled funding is similar to bundled revenues, except that the funding is provided in support of the educational curriculum. For example, instruction on information services as an integral, but small part, of a degree course.
- Embedded funding related to the acquisition of information services knowledge and education that is required to support research. For example as part of a programme of fundamental research a post graduate student may opt to use a computer system as a research tool even though this is not a primary research requirement. Funding is provided for the research, not the acquisition of computer skills.

Exhibit III-2

Market Positioning

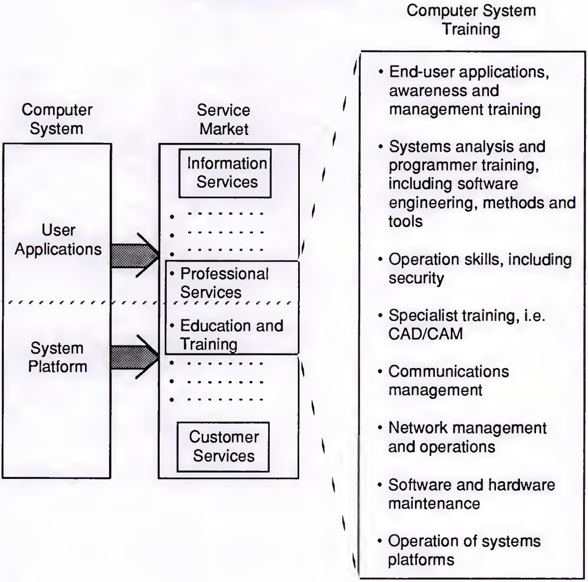

Computer System Training
Computer System
User Applications
System Platform
Service Market
Information Services
• Professional Services
• Education and Training
Customer Services
• End-user applications, awareness and management training
• Systems analysis and programmer training, including software engineering, methods and tools
• Operation skills, including security
• Specialist training, i.e. CAD/CAM
• Communications management
• Network management and operations
• Software and hardware maintenance
• Operation of systems platforms

Exhibit III-3

Information Services Industry Structure

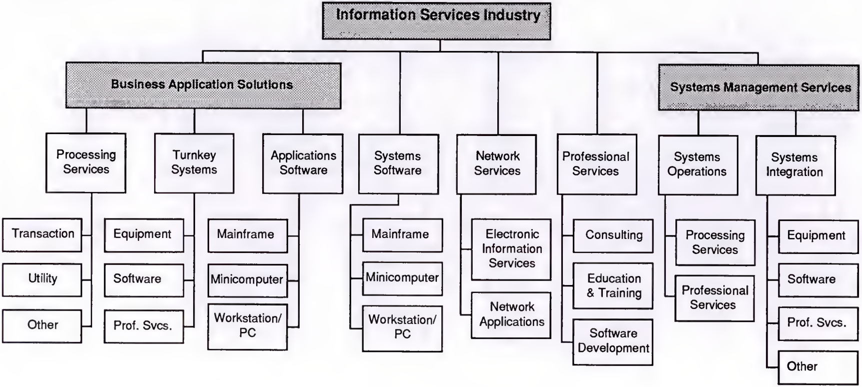


Exhibit III-4

Customer Services Market

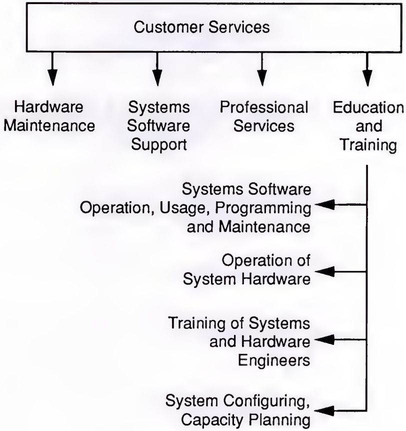

Customer Services
Hardware Maintenance
Systems Software Support
Professional Services
Education and Training
Systems Software Operation, Usage, Programming and Maintenance
Operation of System Hardware
Training of Systems and Hardware Engineers
System Configuring, Capacity Planning

Exhibit III-5

Information Services Training Revenue Streams

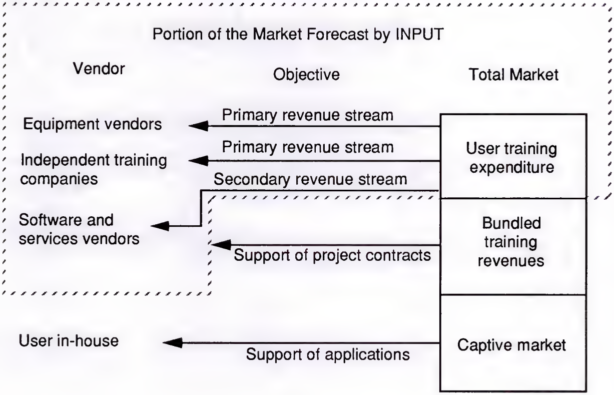
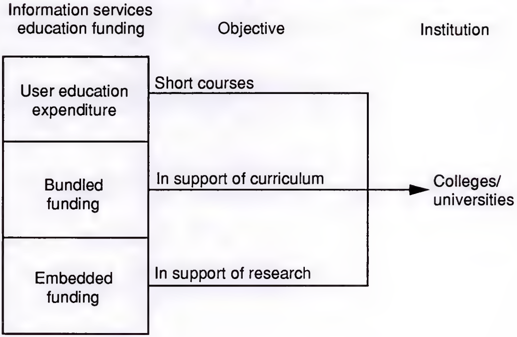

Portion of the Market Forecast by INPUT
Vendor
Objective
Total Market
Equipment vendors
Primary revenue stream
Independent training companies
Primary revenue stream
Secondary revenue stream
Software and services vendors
Support of project contracts
User in-house
Support of applications
User training expenditure
Bundled training revenues
Captive market

Exhibit III-6

Information Services Education Funding



Note: This portion of the market is not measured by INPUT

2. Total Market Size, 1991

Exhibit III-7 provides an estimate for the total size of the information services training market. The presentation in this exhibit divides the market by market sector and subdivides within these sectors by categories of vendor.

Overall, it is estimated that about 10% of user information services expenditure (or cost) is related to training requirements. The information services market in Western Europe is estimated to total about $72 billion in 1991. Deducting an allowance in respect of user expenditure for training and training that is bundled reduces user expenditure for information services to about $68 billion. Of this $68 billion, about $6.8 billion, or 10% is estimated as total training market size.

User expenditure for separately paid for training services accounts for about 36% of the total market, and of this figure about 35% is spent with equipment vendors, 55% with software and services vendors, and the remainder with specialist independent training companies.

A proportion of user training costs are bundled as part of overall project or product costs and not separately identified. These costs amount to about 20% of the total training market and relate to the following market sectors.

- Turnkey solutions
- Systems integration
- Applications software products
- Systems software products
- Professional services
- Network services.

In addition it has been estimated that a small portion, about 10% of equipment vendor training cost are bundled as part of the system platform costs.

User in-house training costs account for about 45% of the total market. The major proportion of these costs, about 80%, result from direct user in-house training on applications. Sometimes an organisation will send two people on a vendor course and then require them to train other personnel in-house.

The remaining 20% of user in-house training is accounted for by processing services and systems operations (FM) vendors. Both these types of vendor become the final end user on successful achievement of a contract to provide services.

Exhibit III-7

Information Services Training in Western Europe Estimated Total Market Size, 1991

Market Sector	Vendor Category	Sector Value ($ Millions)
User Expenditure	- Equipment vendors - Independent training companies - Software and services vendors	850 250 1,350
User Expenditure Subtotal		2,450
Bundled Revenues	- Equipment vendors - Software and services vendors	100 1,250
Captive Revenues	- User in-house training	3,000
Estimated Total Market		6,800

Notes: Provisional data prior to completion of 1991 forecasts
Currency conversion at 1990 rates

D
Delivery Modes

1. Primary Vendors

The information services training direction adopted by the three primary vendors delivering training in the market is illustrated by Exhibit III-8. This exhibit also highlights the primary delivery modes of these companies.

The primary direction of equipment vendor training is focussed at the systems platform level. Training is primarily related to user skill requirements for use of systems software, including associated software tools, and operation of the hardware. In addition equipment vendors also provide training related to:

- Their own applications
- Systems maintenance engineers
- Management/project management

Software and services vendor training focuses primarily on applications, normally their own developed packages but also includes to a lesser extent training on systems software such as UNIX.

Independent training vendor activities also focus primarily on applications but in the case of these vendors this focus tends to be directed towards industry standard applications. In additional independent training vendors also provide, to a lesser extent, systems software training for example, UNIX, OS/2 and MS-DOS.

2. Training and Education Delivery Channels

Exhibit III-9 provides a matrix of the focus of the training activities by all categories of vendor delivering information technology training and refers to the total market, including education. This exhibit is configured to provide an indication of the importance each category of vendor gives to the type of training provided and is segmented in two dimensions by:

- Systems range
  - Hardware
  - Systems software
  - Applications

- Category of Vendor

For example equipment vendor's primary training activities centre on systems software and hardware, whereas systems integrators provide mainly applications training in the mid-range and large systems sectors.

Exhibit III-8

Training Direction of Primary Vendors

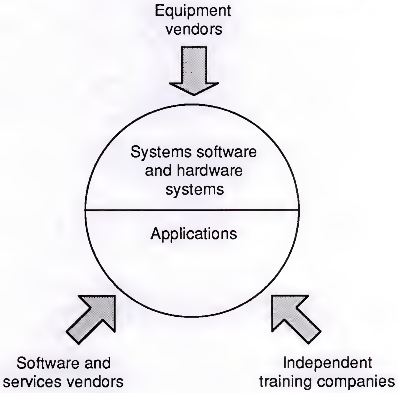

Equipment vendors
Systems software and hardware systems
Applications
Software and services vendors
Independent training companies

Exhibit III-9

Education and Training Delivery Modes

Training Delivery Channel	Focus of Training Activities											
	System Platform											
	PC/Workstation			Midrange Systems			Mainframe			Super-computer		
	Hardware	Systems Software	Applications	Hardware	Systems Software	Applications	Hardware	Systems Software	Applications	Hardware	Systems Software	Applications
Equipment Vendors	H	H	L	H	H	L	H	H	L	H	H	L/M
Independent Training Companies	L	M	H	-	L	M	L	L	L	-	-	-
Systems Integrators	-	-	M	-	-	H	-	-	H	-	-	-
Turnkey Suppliers	L	L	H	L	L	H	-	L	H	-	-	-
Professional Services Vendors	-	L	M	-	M	H	-	M	H	-	-	-
Network Services Vendors	-	-	L	-	-	L	-	-	-	-	-	-
Software Product Companies	-	M	H	-	L	H	-	L	H	-	-	-
Colleges/ Universities	L	M	H	-	M	M	-	L	L	-	L	L
User In-house	L	M	H	-	M	H	-	M	H	L	H	H

H = High level

M = Medium level

L = Low level

IV

The Information Services Training Market in Western Europe, 1991 to 1996

IV The Information Services Training Market in Western Europe 1991 to 1996

A
Introduction

The information services training market is forecast to retain a level of growth that is well above prevailing rates of inflation. However, the rate of growth over the period 1991 to 1996 is subject to recessionary effects and will therefore reduce from that level previously forecast.

The market forecasts contained within this research paper, in line with standard **INPUT** practice, include an allowance for inflation. Compared with previous forecasts the allowance for inflation has been reduced from about 5.5% to 4.0% overall average for Western Europe. This reduction will also provide a negative effect on forecast growth.

B
Market Drivers and Inhibitors

Factors that are responsible for driving and inhibiting growth of the information services training market in Western Europe are illustrated graphically by Exhibit IV-1. This exhibit also indicates the net effect of the positive and negative forces resulting in a positive growth balance.

Factors which are responsible for driving positive growth of the market includes:-

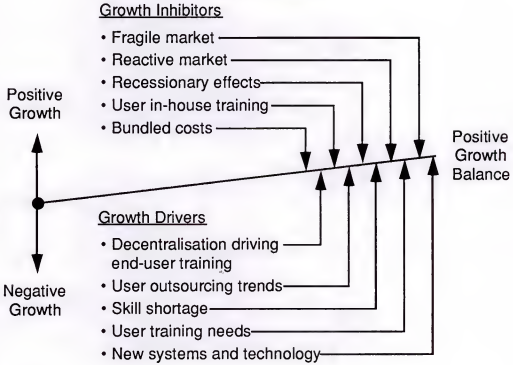
- Decentralisation of computer systems and the control of computer operation is causing an increasing need for end user training. This need being a requirement at virtually all levels in user organisations.
- Pressure on users to improve the competitiveness of their business operations, and the consequent pressure to reduce internal costs, is increasing the potential for a shift from user in-house training to outsourcing.
- A consensus of opinion among vendors indicates that there is a shortage of skills within the computer industry overall and in user organisations which will stimulate the growth of training. However, recessionary forces causing reductions in industry staffing levels and user outsourcing will tend to offset this to a degree.
- Implementation of new systems and technology increases user needs for training as a result of the need to operate these new systems.

Factors responsible for inhibiting growth of the information services training market include:-

- The market for training is considered to be fragile in that user training budgets are often the first item to be cut in times of recession. Therefore the training market is likely to suffer from over-reaction to recessionary effects as users seek to reduce costs.
- Training vendors tend to be reactive to user needs and training requirements tend to be project driven. This reactive approach will tend to inhibit market growth due to the dependency of training on other factors, such as new project being implemented. There is little evidence of vendors, or users, adopting a pro active approach to training which would provide a positive stimulant to market growth.
- User in-house training activity removes a portion of the market available to training vendors. This portion of the market is estimated to be relatively high, about 45% of the total information services training market is estimated to be satisfied by in-house training programmes. However, the increasing trend towards outsourcing within the industry should in part compensate for this growth inhibiting factor.
- The building of training costs with overall project costs is a further factor inhibiting growth of the information services training market. It is estimated that building of training costs accounts for about 20% of the total market.

Exhibit IV-1

Information Services Training Market Drivers and Inhibitors



C
Market Forecast 1991 to 1996

1. Market Growth 1991 to 1996

Exhibit IV-2 provides a forecast for the growth of user expenditure for information services training over the period 1991 to 1996.

User expenditure for training as a separately identified and paid for item is estimated to account for about 35% of the total market for training. The remainder of the total market, which can be considered as captive, is estimated as follows:-

- About 45% of the total market is taken up by user in-house training activities
- About 20% of the total market is comprised of training cost that are bundled with project costs. For example included within the overall costs of a systems integration project.

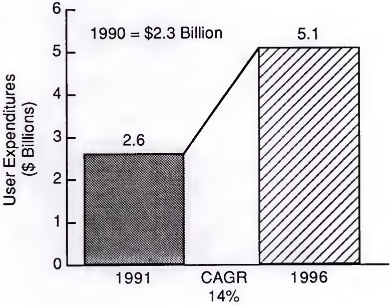
Taking into account the captive portion of the market, the total market in 1991 is estimated at about $7.2 billion.

The growth forecast for the informative services training market in Western Europe is about 14% CAGR between 1991 and 1996. This figure represents a relatively significant reduction on previous growth forecasts, for example **INPUT** previously forecast a growth of 21% over the period 1990 to 1995. Justification for this reduction in forecast growth is as follows:-

- The inflation content of the forecast growth has reduced by about 1.5%
- As a result of recessionary pressures within the computer industry growth of the professional services market, of which training forms a part, is estimated to have reduced by about 2.5% in real terms
- The fragile nature of the training market is likely to result in over-reaction by users in reducing training expenditure. Therefore the training market is considered to be more susceptible to recessionary factors accounting for about 2% further reduction in growth.

Exhibit IV-2

Market Growth of Information Services Training in Western Europe, 1991-1996



Note: Rounded numbers

2. Market Segment Growth 1991 - 1996

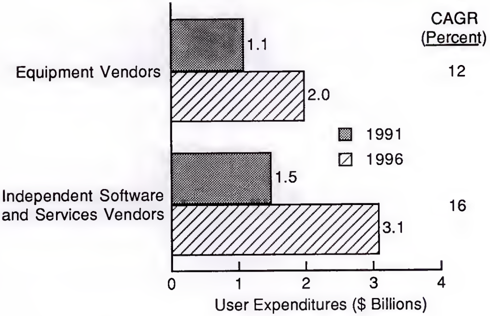
Exhibit IV-3 provides a forecast for growth of the information services training market in Western Europe segmental by vendor type.

In 1991 user expenditure for training provided by equipment vendors represented about 42% of the total. The balances of user expenditure for training services is captured by independent software and services vendors.

The higher growth rate being forecast for independent software and services vendor training activities will result in the market share of these vendors increasing slightly from the current 58% to over 60% by 1996.

Exhibit IV-3

Information Services Training Market Growth by Vendor in Western Europe, 1991-1996



Note: Rounded numbers

1990	Equipment Vendors	$1.0 Billion
	Software and Services Vendors	$1.3 Billion

3. Leading Vendor Revenues

Estimates of the information services training revenues of the leading vendors in Western Europe are listed in Exhibit IV-4 and IV-5.

Exhibit IV-4 provides estimates related to the leading independent software and services vendor training revenues and Exhibit IV-5 the leading equipment vendor training revenues.

Two major characteristics differentiate between the two types of vendor

- The relatively fragmental nature of the market serviced by independent software and services vendors where the leading vendor revenues account for about ?% of the total for the market sector.
- The relatively dominant market position held by the leading equipment vendors whose revenues account for almost 80% of the total for the market sector.

The position of Cap Gemini Sogeti has been re-enforced as market leader in the independent sector as a result of their acquisition of Hoskyns, the prior acquisition by Hoskyns of The Instruction Set and the Education and Training Business of Datasolve. These companies, now part of CGS were themselves among the leading independent training vendors prior to acquisition.

Fragmentation of the market is further compounded by the fact that the majority of dealers and distributors also provide training services, mostly related to industry standard applications.

Exhibit IV-4

Leading independent Software and Services Vendor Training Revenues Western Europe - 1990

VENDOR	1990 REVENUE ($ MILLIONS)	PERCENTAGE OF TOTAL
CGS	100	8.0
Applied Learning	45	3.5
Learning Tree	28	2.0
Sphinx-Level V	20	1.5
Integrata	14	1.0
Sligos	12	1.0
BIS	10	1.0
National Computing Centre	10	1.0
Unilog	10	1.0
Cegos	10	1.0
OTHERS	1025	79
TOTAL FOR MARKET SECTOR	1280	100%

Exhibit IV-5

Leading Equipment Vendor Training Revenues Western Europe - 1990

VENDOR	1990 REVENUE ($ MILLIONS)	PERCENTAGE OF TOTAL
IBM	155	16.0
Digital	145	15.0
NCR	105	11.0
Bull	70	7.0
Unisys	65	6.5
Olivetti	50	5.0
Siemens	50	5.0
Wang	50	5.0
HP	45	5.0
ICL	35	3.5
OTHERS	210	21.0%
TOTAL FOR MARKET SECTOR	980	100.0%

4. Country Market Growth 1991 to 1996

Exhibit IV-5 provides a forecast for the growth of user expenditure for information services training in thirteen country markets in Western Europe and the rest of Europe. These forecasts are presented in US dollars converted from local currency.

Comments relating to growth in these individual country markets are as follows:-

- France; Recessionary pressures are reducing market growth but growth is forecast remain relatively constant over the forecast period. The Independent software and services vendor market share is estimated at about 70%.
- Germany; the structure of the German market is changing but the overall software and services market growth is relatively constant over the forecast period. The relative stability of the German economy indicates that the market is likely to be less effected by recessionary pressures than other country markets. The growth of training in the German market is forecast to mirror these trends.

- United Kingdom; the market outlook is relatively unhealthy. Growth is anticipated to be relatively low up to 1993/4 at which time it is expected to improve as the economy recovers and confidence returns.

- Italy; There is a dominant public sector in the Italian market which is holding back the development of the independent sector. Currently independent vendors retain only about a 48% market share. Growth is estimated to be fluctuating around a steady growth figure.

- Sweden; A high degree of uncertainty in the economy and high inflation will likely result in growth declining between 1994 and 1996.

- Denmark; the software and services market is considered to be relatively saturated, but steady growth will likely be maintained. Equipment vendors tend to dominate the information services training market with about 65% market shareable and steady growth, with inflation estimated at about 3.3%. This market is considered less susceptible to recessionary pressures.

- Spain; Vendor optimism relative to their market continues to be apparent. However, the longer term (1995/96) is subject to a degree of uncertainty due to the likely impact of recessionary pressures, particularly in other European countries. The economy is to a degree dependent of the holiday industry.

- Switzerland; this market is considered less stable than previous but is nonetheless anticipated to experience above average growth. The training market is relatively evenly divided between equipment vendors and independents.

- Austria; this market is seen as benefiting from serving as a conduit for Eastern Europe. The result of this factor is anticipated to lead to a steady increase in growth for software and services. However, this increase in growth is less likely to be reflected in the training market as products will tend to "pass through" the country.

Exhibit IV-6 provides a country market forecast in US dollars converted from local currency.

Exhibit IV-7 provides a country market forecast expressed in local currency.

Exhibit IV-8 provides a country market forecast in ECU's converted from local currency.

Exhibit IV-6

Information Services Training Market Growth 1991 - 1996 (US Dollars)

Country Market	Vendor Type	User Expenditures ($ Millions)			CAGR 1991-1996 (Percent)
		1990	1991	1996	
France	Equipment Vendors	155	169	260	9.0
	Independent Vendors	353	406	802	15.0
Germany	Equipment Vendors	188	211	392	13.0
	Independent Vendors	307	366	815	17.0
United Kingdom	Equipment Vendors	213	243	408	11.0
	Independent Vendors	204	223	418	13.0
Italy	Equipment Vendors	102	106	151	7.0
	Independent Vendors	78	98	245	20.0
Sweden	Equipment Vendors	45	53	111	16.0
	Independent Vendors	47	54	102	14.0
Denmark	Equipment Vendors	22	25	49	14.0
	Independent Vendors	11	13	23	13.0
Norway	Equipment Vendors	22	26	56	16.0
	Independent Vendors	15	17	34	15.0
Finland	Equipment Vendors	23	25	39	10.0
	Independent Vendors	10	12	24	15.0
Netherlands	Equipment Vendors	53	59	104	12.0
	Independent Vendors	112	133	305	18.0
Belgium	Equipment Vendors	22	25	51	15.0
	Independent Vendors	32	39	94	19.0
Spain	Equipment Vendors	45	54	119	17.0
	Independent Vendors	27	32	75	19.0
Switzerland	Equipment Vendors	51	59	134	18.0
	Independent Vendors	59	67	122	13.0
Austria	Equipment Vendors	16	18	36	14.5
	Independent Vendors	20	23	44	14.5
Rest of Europe	Equipment Vendors	18	22	54	19.0
	Independent Vendors	5	6	14	18.0
Subtotal (Rounded)	Equipment Vendors	980	1,100	1,970	12.0
	Independent Vendors	1,280	1,490	3,130	16.0
Overall Total (Rounded)		2,260	2,590	5,100	14.0

Exhibit IV-7

Information Services Training Market Growth, 1991-1996 (Local Currency)

Country Market	Currency	Vendor Type	User Expenditures			CAGR 1991-1996 (Percent)
			1990	1991	1996	
France	FF Millions	Equipment Vendors Independent Vendors	875 1,995	955 2,295	1,470 4,530	9.0 15.0
Germany	DM Millions	Equipment Vendors Independent Vendors	315 515	355 615	660 1,370	13.0 17.0
United Kingdom	£ Millions	Equipment Vendors Independent Vendors	110 105	125 115	210 215	11.0 13.0
Italy	Lira Billions	Equipment Vendors Independent Vendors	125 95	130 120	185 300	7.0 20.0
Sweden	SK Millions	Equipment Vendors Independent Vendors	255 266	295 300	620 570	16.0 14.0
Denmark	DK Millions	Equipment Vendors Independent Vendors	140 70	160 80	310 145	14.0 13.0
Norway	NK Millions	Equipment Vendors Independent Vendors	145 95	170 110	360 220	16.0 15.0
Finland	FM Millions	Equipment Vendors Independent Vendors	90 40	100 47	155 94	10.0 15.0
Netherlands	Dfl Millions	Equipment Vendors Independent Vendors	90 190	100 225	175 515	12.0 18.0
Belgium	BF Millions	Equipment Vendors Independent Vendors	750 1,110	860 1,340	1,750 3,250	15.0 19.0
Spain	Pta Millions	Equipment Vendors Independent Vendors	4,300 2,600	5,100 3,000	11,300 7,100	17.0 19.0
Switzerland	SF Millions	Equipment Vendors Independent Vendors	65 75	75 85	170 155	18.0 13.0
Austria	AS Millions	Equipment Vendors Independent Vendors	190 230	215 265	420 520	14.5 14.5
Rest of Europe	$ Millions	Equipment Vendors Independent Vendors	18 5	22 6	54 14	19.0 12.0

Exhibit IV-8

Information Services Training Market Growth, 1991-1996 (ECU's)

Country Market	Vendor Type	User Expenditures (ECU Millions)			CAGR 1991-1996 (Percent)
		1990	1991	1996	
France	Equipment Vendors	113	123	190	9.0
	Independent Vendors	258	297	585	15.0
Germany	Equipment Vendors	137	154	287	13.0
	Independent Vendors	224	267	596	17.0
United Kingdom	Equipment Vendors	156	178	298	11.0
	Independent Vendors	149	163	305	13.0
Italy	Equipment Vendors	74	77	110	7.0
	Independent Vendors	56	71	178	20.0
Sweden	Equipment Vendors	33	38	81	16.0
	Independent Vendors	35	39	74	14.0
Denmark	Equipment Vendors	16	18	35	14.0
	Independent Vendors	8	9	17	13.0
Norway	Equipment Vendors	16	19	41	16.0
	Independent Vendors	11	12	25	15.0
Finland	Equipment Vendors	17	18	29	10.0
	Independent Vendors	7	9	17	15.0

Exhibit IV-8 (contd)

Information Services Training Market Growth, 1991-1996 (ECU's)

Country Market	Vendor Type	User Expenditures (ECU Millions)			CAGR 1991-1996 (Percent)
		1990	1991	1996	
Netherlands	Equipment Vendors Independent Vendors	39 82	43 97	75 222	12.0 18.0
Belgium	Equipment Vendors Independent Vendors	16 23	18 28	37 69	15.0 19.0
Spain	Equipment Vendors Independent Vendors	33 20	39 23	87 55	17.0 19.0
Switzerland	Equipment Vendors Independent Vendors	37 43	43 49	98 89	18.0 13.0
Austria	Equipment Vendors Independent Vendors	12 14	13 16	26 32	14.5 14.5
Rest of Europe	Equipment Vendors Independent Vendors	13 4	16 4	39 10	19.0 18.0
Subtotal (Rounded)	Equipment Vendors Independent Vendors	715 935	800 1,080	1,430 2,270	12.0 16.0
Overall Total	(Rounded)	1,650	1,880	3,700	14.0

V

Key Trends and Opportunities for Training Vendors

V Key Trends and Opportunities for Training Vendors

A
Introduction

Two important factors concerning user requirements for information systems skills are likely to be responsible for changes in user needs for training services. These factors are:

- The continuing shift of computer operations away from traditional centralised organisations and control towards departmental and business unit responsibility for information services.

- Computer users seeking ways to minimise the cost of computer operations, as part of an overall cost reduction programme, aimed at improving the competitiveness of their businesses.

The impact of these factors on the information services training market will be felt in two key areas:

- A polarisation of user skill requirements.

- An evolution of training delivery methods.

Opportunities within the information services training market will be presented to those vendors able to structure their products to meet the changing requirements of users.

B
Changing User Skill Requirements

1. Changing Focus of User Training Needs

As the decentralisation of computer operations within user organisations continues, and computer operations change from being a provider of data to being a supplier of business information, user requirements for information services training will follow a course of evolutionary change.

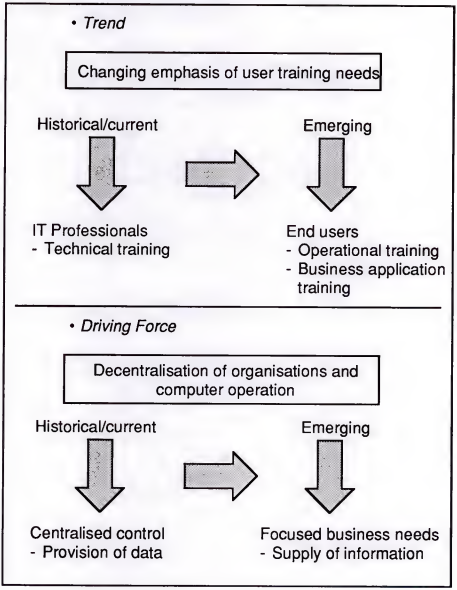
A diagrammatic illustration of this change is provided by Exhibit V-1, together with illustration of the driving force that is responsible for the change.

The major change that is occurring in user organisations and which is the key driving force behind changing user requirements for information services training can be summarised as follows:

- Historically, and to a degree still current, computer systems have tended to be operated by central organisations as a means of collecting and collating data. An increasing proportion of this data is concerned with providing a data base that can be manipulated to support user business operations and decision making.

Exhibit V-1

Changing Focus of Training Needs



- *Trend*

Changing emphasis of user training needs

Historical/current

IT Professionals
- Technical training

Emerging

End users
- Operational training
- Business application training

- *Driving Force*

Decentralisation of organisations and computer operation

Historical/current

Centralised control
- Provision of data

Emerging

Focused business needs
- Supply of information

- The emerging trend is to decentralise computer operations at the departmental and business unit level. The objective behind this trend is to increasingly develop systems that provide information on which decisions are based.

As a result of these two factors, the focus of user information systems training is changing. USers will focus more heavily on the development of skills within the end user environment and less on technical skills. The development of end user skills will involve the acquisition by end users of both operational and business applications skills. The aim will be to maximise the use of computer systems as business tools, rather than focus on the computer systems.

2. User Skill Trends

Exhibit V-1 provides a model illustrating the impact of trends in computer systems applications on user needs for computer systems skills.

As user organisations increasingly focus on business applications the need for developing end user business application skills increases. User organisations will focus more and more on developing a relatively high level of end user skills with end users needing to be competent not only in the use of business applications, but also in the use of application tools, database development, customised use of applications and networking.

As a consequence of increasing emphasis on a high level of end user skills the emphasis placed on lower levels of end user skills will decrease. In brief end users will become more providers of information than collectors of information, and the positions of end users will move up the organisational tree of a company, from clerical positions to management and executive level.

As end user skill levels improve and the decentralisation of computer systems continues, users will encounter reducing need for lower level technical skills. The organisational requirement for lower level technical skills will progressively be replaced by improved software technology and improved end user skills.

However, in order to achieve improved software technology and capability. users will need to focus more highly on ensuring the availability of a highly skilled technical resource to support this trend.

The trend in user skill requirements is illustrated in graphical form by Exhibit V-3. This exhibit highlights two key trends:

- The increasing level of end user skills and the increasing size of the end user information services resource required by the increasing application of computers to business activities. However, an overall increase in user resources is not anticipated, the increase in end user computing staff will be as a result of changes in job requirements.

- A reduction in the quantity of technical computer staff but also an elevation in the skills levels of those staff that remain.

Historically, and to a degree currently, end user computing skills have been limited to people occupying relatively low positions in a organisation, for example accounts administrative staff using computers as an alternative to calculators.

By comparison technical computer staff were historically highly skilled graduates or post graduates, working at levels of great detail and complexity manipulating and developing software code. As time progressed the need for high degrees of technical competence decreased, and people with aptitude and specific training took over the majority of technical activities from highly qualified staff. History is now set to reverse.

User skill requirements will in future become increasingly polarised towards requiring a smaller number of highly skilled and qualified technical staff and an increasing number of skilled end users. The middle range between these two, currently occupied by trained technical staff will tend to be eroded quite significantly, and at least in part be replaced by software development tools. Therefore future training opportunities for vendors will tend to focus in these areas where user skill requirements are increasing.

Exhibit V-2

Impact of Changing Focus on User Skill Needs

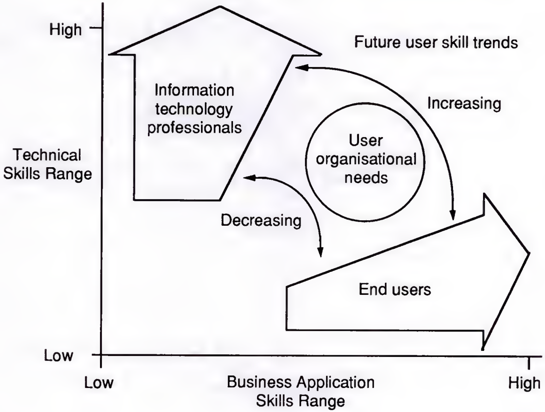
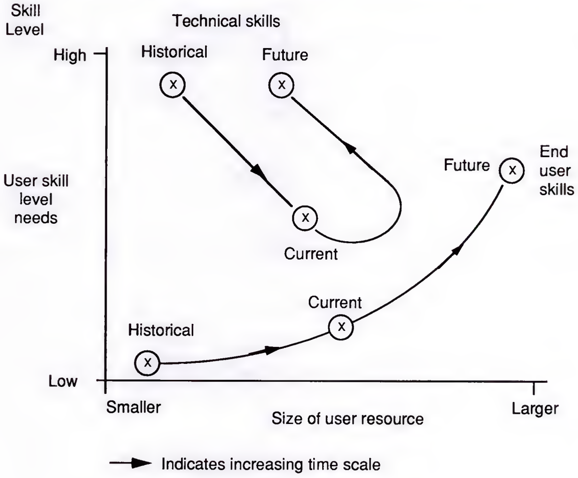


Exhibit V-3

Changing User Requirements for Computer Skills



C
Changing Delivery Modes

1. Changing Emphasis

The changing emphasis of the delivery mode of user information services training is illustrated by Exhibit V-4.

Historically the delivery of user training whether supplied by an external vendor or by the users in house resources, has been an off-site activity. The group of users requiring training has been taken away from the normal place of work for periods of say one week and training has been delivered in an interactive environment by suitably qualified instructors. This practice of off-site training is still relatively common, particularly where technical training is concerned. Exhibit V-4 indicates that currently about 80% of computer training is conducted off-site.

Off-site training is a relatively expensive item for computer users. Costs include, in addition to the direct cost of the course, those costs associated with travel, hotel accommodation and the cost of lost productivity.

Typical total costs for a one week off-site training course per person are as follows:

- Course fee - $2,000
- Travelling and accommodation costs - $1,100
- Productivity losses - $4,000

Therefore, the "hidden" costs of a one week training course can exceed the cost of course fees by an additional 350%. The total cost of a one week training course being typically over $7,000 per person.

As users seek to improve the competitiveness of their own business through cost reduction programmes, the costs of training are more likely to be fully exposed. Further, as users implement staff reductions as an element of cost reduction programmes, resistance to releasing staff for off-site training is likely to increase.

One result of these trends is the creation of opportunities for vendors to:

- Reduce the total cost of training to users.
- Implement training delivery modes that are less disruptive to the users' business.

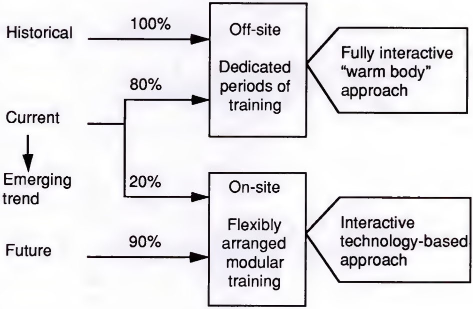
In future there is likely to be a significant shift from off-site to on-site modularised training which relies on a technology solution. This technology solution is the development of interactive training using audio/visual techniques that can be accessed via on-site terminals at times most convenient to the user. For example the type of training provided by Applied Learning International.

Exhibit V-4 indicates the current situation where an estimated 80% of training is conducted off-site will evolve in future to an estimated 90% of training being delivered on-site using technology based solutions.

The key to this trend is the successful development of interactive technology to enable the approach to provide an adequate medium for effective user training and a change in attitudes to training methodology.

Exhibit V-4

Changing Training Delivery Modes


Historical
100%
Off-site
Dedicated periods of training
Fully interactive "warm body" approach
80%
Current
Emerging trend
20%
On-site
Flexibly arranged modular training
Interactive technology-based approach
Future
90%

2. Opportunity for Innovation

Exhibit V-5 highlights two opportunities which can be exploited to reduce the disruption to user organisations caused by off-site training.

The first of these opportunities concerns the delivery of user training on-site through the medium of discrete training packages. These training packages are in the form of an interactive audio/visual medium which can be accessed via off-line terminals. The advantages of this form of delivery are:

- The trainers do not have to leave their workplace.
- The training curriculum can be broken down into easily managed modules of say one to two hours duration each.
- Trainees can plan to access the training material flexibly to suit other elements of workload.
- A potential for achieving significant reductions in the hidden costs of training.

A disadvantage of providing training by this method is the level of interaction that can be achieved with the training delivery vehicle. At present with current technology, this level of interaction is somewhat limited when compared with the "warm body" approach.

A second opportunity is presented by the potential for embedding training modules within user applications. The key aspect of this approach is that the training module should ideally be developed concurrently with the application package at the design stage. The major advantages of this approach are:

- Provision of an on-line interactive training medium.
- User training can be achieved in manageable modules with a high degree of flexibility such that training can be structured to match workloads.
- Potential for significant reduction of on-going costs.
- The ability to provide ongoing access as a "look up" facility.
- The option to include full documentation and support data as part of the training module.

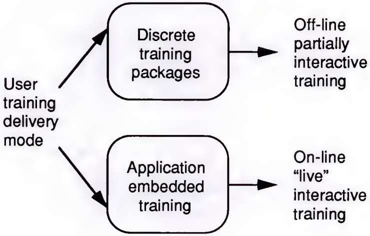
An outline model of an embedded training module is illustrated by Exhibit V-6. This exhibit indicates that an embedded training module is much more than a simple "help" facility.

However, a major potential benefit of this approach is that the user can simulate real life events and activities without the risk of corrupting live systems, provided that the necessary security aspects are built in.

A second major advantage is that individual assessment of user skills can be provided, on an ongoing basis, and accessed by the user and management.

Exhibit V-5

Innovative On-site Training


User training delivery mode
Discrete training packages
Off-line partially interactive training
Application embedded training
On-line "live" interactive training

Exhbit V-6

Application Embedded Training

User Application

Embedded Training Module

- Inbuilt operation and support documentation
- Instruction sets and flow diagrams
- Layered training modules
  - Dummy worksheets
  - Simulated tasks
  - Simulated system interaction
  - Use of problem databases
  - Use of bulletins and bug-fix routines
  - Use of software tools
  - Development of subroutines and customisation techniques
- Inbuilt assessment of individual user skill level and competence

3. Leading Edge Approach

One potential leading edge approach to training is the use of satellites as a delivery medium. Discussions within the industry have tended to produce a rather cynical response to the use of satellites as a training medium, some comments made are as follows:

- The satellite concept is less of a provider of training more just an exotic delivery vehicle.
- Very expensive, needs large clients with large budgets.
- Can be useful for the delivery of leading edge material.
- Other product developments could evolve faster and therefore result in the approach being "still born" for example ISDN could pre-empt" the satellite concept.
- There is a shortage of commercial satellite space and the incoming and out going bandwidths are non-symmetrical limiting the degree of interaction possible.
- The future of the satellite concept is suspect due to the question marks hanging over the ability to achieve commercial margins.

Although many of the preceding comments are of a negative nature the potential for the capability of satellites to provide an alternative to off-site interactive training should not be dismissed. One company EuroPace, is currently delivering about 400 hours of satellite based training per year, in partnership with other organisations.

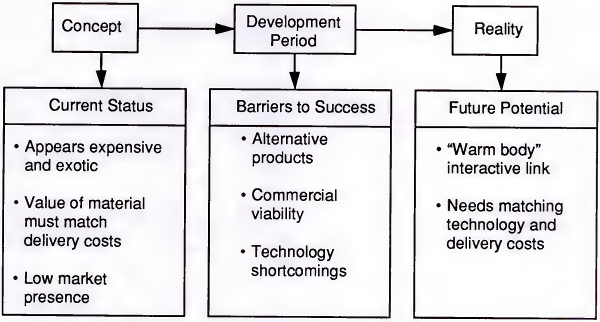
Exhibit V-7 provides a summary of the current status and future potential for satellite based training and also indicates some of the barriers to success.

The key factor limiting success currently are the limitations of technology which in turn limit the current applications of the medium. However, the degree of success achieved by EuroPace should not be underestimated as a pioneering activity. A profile of EuroPace is included in Section VIII of this study.

EuroPace would argue that satellite training is not expensive, rather that it is cost effective. The company would also not disagree that at present the satellite link incorporated is purley a delivery vehicle that is a cost effective mechanism.

Exhibit V-7

Satellite-Based Training


Concept
Development Period
Reality
Current Status
• Appears expensive and exotic
• Value of material must match delivery costs
• Low market presence
Barriers to Success
• Alternative products
• Commercial viability
• Technology shortcomings
Future Potential
• "Warm body" interactive link
• Needs matching technology and delivery costs

VI

Key Issues and Challenges in the Training Market

VI Key Issues and Challenges in the Training Market

A
Introduction

Discussions with vendors have identified a number of key issues and challenges that are presented by the training market. This section of the study provides discussion on those key issues and challenges and also quantifies them.

A list summarising the comments made by vendors when discussing the market for training services is included.

B
Changing Environment

The role of the training vendor is changing as the training market changes and evolves. The trend in changing market conditions and the key issues and challenges that these changes are producing is illustrated in Exhibit VI-1.

There are two key trends influencing the way in which vendors need to change their approach to accessing the training market:

- As user organisations move progressively towards the decentralisation of computer operations the historical centralisation of control and IT budgets is being redirected towards the end user level. This decentralisation is causing fragmentation of the training market. Where previously training vendors could negotiate company wide (and often long term) contracts through a central focal point, they are now faced with the increasing need to access user training requirements at the departmental level. The impact of this change is to cause a fragmentation of the sales activity, one element of which is the sale of individual training products rather than training contracts.

- The role of the trainer is changing. Historically the trainer was essentially a delivery mode providing a course of pre-arranged training at some off-site location. As a result of an emerging trend towards workplace based training the role of trainer will evolve from being a delivery mode to a training provider.

As a consequence of these two key trends training vendors will likely need to modify their approach to marketing and sales in order to access more fragmented end user markets. Approaches under consideration and trials by vendors more advanced in the delivery of technology based training solutions are already under way including implementation of telesales and mail-shots.

As the delivery of technology based training gains momentum vendors will find revenues likely to reduce as a consequence of the reduced prices that are likely to result. Therefore, in order to compensate for reducing revenues vendors will need to gain access to additional markets. One avenue available to vendors is to penetrate the portion of the training market that is currently retained by users in the in-house delivery of training, using new training technology as a means of access.

Exhibit VI-1

Changing Role of Training in a Changing Market

Key Trends and Changes	User Organisational Change Centralised Budgets and Control → Decentralisation Causing Fragmented Market Role of the Trainer Historically a Delivery Mode → Becoming a Provider
Key Issues and Challenges Resulting from Change	Need to: • Access end-user markets • Penetrate user "in-house" market • Be more proactive • Develop training as strategic component of end-user business

Training needs to become more proactive. As the market for training evolves vendors will find themselves in the position of having to develop and offer solutions to users training needs rather than following market demand. Part of this need is to develop training products in such a way as they become a strategic component of the users business operations and as such elevate training to a critical component level.

C

Economic Recession

The key issues raised by economic recession and the challenges that are presented to vendors are illustrated in Exhibit VI-2.

The issues of reduced training budgets and reduction in graduate recruitment are relatively standard reactions that occur at times of economic recession. However, one positive optimistic factor identified by vendors was that economic recession can cause users to re-focus on their core business which increases outsourcing, including the need for training which vendors can capitalise on. Also, as users refocus on their business this often highlights critical training needs which need to be satisfied.

Economic recession also provides training vendors with a challenge to create user awareness of the need to continue training programmes and also to provide justification for the user doing so. These challenges can be summarised as follows:

- Create user awareness that economic recession can be seen as an opportunity to review future skill needs and use the period of recession to put in place programmes aimed at developing the skill base required for future operational activities.
- Create user awareness that recessionary effects are transient and short term reduction in training budgets can be more costly in the long term. As users cut training budgets, staff can become progressively more discontented and look for alternative employment. The results of staff attrition can significantly increase training costs as new staff require a higher degree of training.
- Vendors can also take steps to provide justification to users that training programmes can be continued. This can be achieved by a number of approaches two of which include:
  - Demonstration of the cost effectiveness of training as an aid to improved productivity and the improvements that can be gained from specific training programmes.
  - Assist the user in the measurement of productivity gains and also provide possible incentives. For example Learning Tree offer a full course fee refund if users are not 100% satisfied with the results of a training course.

Exhibit VI-2

The Impact of Economic Recession on the Training Market

Recessionary Effects

1. User budgets reduced
2. Reduction in graduate recruitment
3. Beneficial refocusing of user business

Vendor Challenges

1. Create user awareness
    - Opportunity to re-skill for the future
    - Short-term cost savings lead to long-term cost increases
2. Provide justification
    - Improved cost effectiveness
    - Measurable user benefits

D
The Skills Issue

Exhibit VI-3 highlights the factors that are contributing to the skills issue and the challenges that this issue presents to vendors.

There is a consensus among a minority of vendors, about 10%, that the skill shortage is at least partly a myth. But, and more important, there is a general consensus among vendors that users do not make the best use of the skill resources that they have. There is therefore a challenge for training vendors to ensure that users optimise the use of existing resources and hence generate training revenues as a result of pursuing this opportunity.

The fast changing pace of the technological development of computer systems is a further factor that is contributing to the skills issue. These developments create the need for new skills and there are a number of ways to address the overall issue of skills, two of which are as follows:

- Implement training programmes aimed at extending the range of skills attributed to traditional DP staff. For example provide user training solutions which extend the skill ranges of these staff to include networking, data communications, software engineering and image processing.
- Implement training programmes aimed at encouraging user to focus on retraining and constantly training existing staff rather than focusing on new staff. This approach could be particularly effective in times of recession when graduate recruitment is reduced and vendors claim that user do tend to focus training on new hires. There is also potential for justifying this approach by highlighting the potential for cost savings that can be obtained from training existing staff as opposed to new staff.

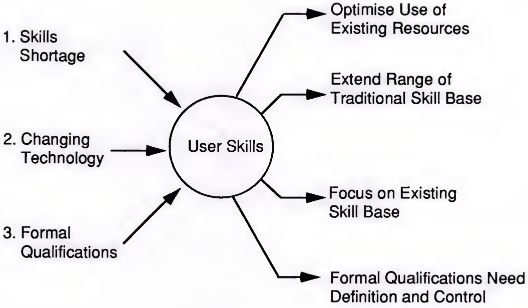
The issue of formal qualifications, that is specific formal qualifications, is a relatively new challenge and opportunity. For example, formal certificates relating to competence SSADM. Although this approach is in a state of relative infancy companies such as SD-Scicon currently run such courses under guidelines laid down by the British government.

The issue of formal qualifications does require the involvement of some recognised official regulatory bodies and also needs further definition and control. Nonetheless this approach does not create opportunities for vendors to develop a concerted joint effort, as a body, aimed at achieving implementation and promoting growth within the training body, aimed at achieving implementation and promoting growth within the training and highlight return on investment.

The issue of management awareness of the needs of information services is not an issues that can be solved by an IT training solution. However, until this issue is solved by other means it retains the potential to act as a barrier to recognition of training needs and hence the progression of training and market growth. Nonetheless, training vendors should continue to address this issue as a component of stimulating need through awareness using all possible approaches, even though the degree of impact their activities can achieve may be limited.

Exhibit VI-3

The User Skills Issue


1. Skills Shortage
2. Changing Technology
3. Formal Qualifications
User Skills
Optimise Use of Existing Resources
Extend Range of Traditional Skill Base
Focus on Existing Skill Base
Formal Qualifications Need Definition and Control

E
New Technology

The implementation of new technology is a key issue in the training market. Exhibit VI-4 provides a graphical illustration of the estimated progression of training technology.

The key issue relative to the development of training technology is less concerned with the actual products that are developed but more concerned with the need to develop technology solutions. The real market need is the development of technology based solutions as a cost effective alternative to the more costly and more disruptive traditional approach to training.

Chapter V of this study indicated a trend that technology based training conducted in on-site locations would achieve significant market share. What is more difficult to predict is the timing of this change. However, it is assumed that the development phase for on-site technology based training solutions will occur over the next five years and that at the end of this period it will have started to gain a recognisable market presence. Applied Learning already market a range of technology based training solutions.

One issue related to technology based training is the limited degree of interaction that is possible at present, a factor that is unlikely to be resolved in the medium term. Therefore, a longer period of development will be required before technology based training solutions can fully be considered alternative to the traditional "warm body" approach. This longer period of development is estimated at about 15 years.

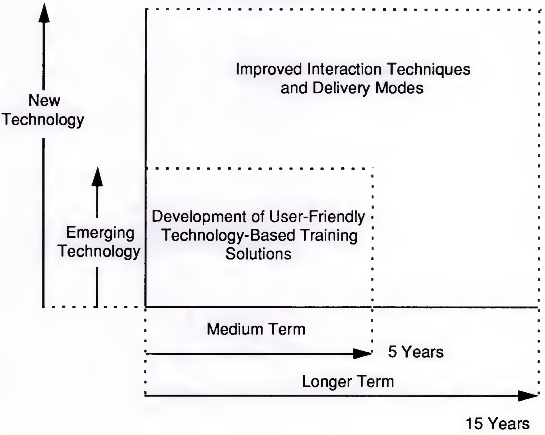
One characteristic of new technology is that, whatever the pace of market development, the gestation period from concept to practical application changes very little. Technology gestation periods are typically 10 to 15 years, often longer.

The final training product that emerges is less important than provision of a solution. There are however, a number of potential candidates, for example:

- ISDN
- Application embedded training
- Satellite based training.

Exhibit VI-4

New Training Technology


New Technology
Emerging Technology
Improved Interaction Techniques and Delivery Modes
Development of User-Friendly Technology-Based Training Solutions
Medium Term
5 Years
Longer Term
15 Years

F
Vendor Comments

During the course of discussion with vendors they were invited to express opinions on the key issues and challenges in the information services training market. A selection of these comments has been collated and is listed in Exhibit VI-5.

Exhibit VI-5

Vendor Comments on Issues and Challenges in the Training Market

- Training trends to be a reactive rather than a proactive activity in that it tends to be driven by project needs

- In many cases users would likely achieve a better return on training investment by focussing investment towards their existing skill base. The focussing of training on new hires contains a higher risk as these people are more of an unknown quantity and are more mobile.

- A good return of investment, for both the vendor and the user, will stimulate market growth. Failure to achieve this requirement could have a negative effect.

- Software tools can provide a degree of substitution for people, but there are problems related to achieving pan-European agreement on what these tools are and how they are defined or implemented.

- There is an increasing need to identify and justify training for skills that are strategic to the core business of a company.

- Training vendors need to be more aligned to the needs of the computer. For example the provision of customised trainng which includes practical examples in live situations.

- The range of technical professional skills need to be extended beyond those of the traditional DP environment to include for example:

  - Data Communications
  - Graphics
  - Image Processing
  - Networking
  - Software Engineering

Exhibit VI-5 (continued)

Vendor Comments on Issues and Challenges in the Training Market

- CASE tools tend to be a misnomer and neef further development.
- There will be an upsurge of training in project management and methods aimed at achieving technical competence and disciplines.
- The cost of travelling and cost of less access to people caused by training can exceed the direct cost of the training course.
- There is a real skill shortage but users often do not make the best use of available resources
- There is risk that people quickly get out of touch with fast moving technology. Therefore there is an opportunity of re-training and constant training.
- The UK market has a built in aversion of training.
- Training is not very proactive, it is more reactive to new ideas.
- In times of recession businesses are forced to focus more clearly on the needs of the business which, in the long term, can only be beneficial for training.
- Is there real growth left in training computer people about computers? It is more likely that the real growth of training lies in the potential for training non-computer people to grain competency. Further, there may be growth potential in training computer people in non-computer subjects such as business skills.
- There is a real need for individuals to take more responsibility for training.
- There are opportunities for training:

  - Change management
  - Project management
  - Service management.
- The UK market is becoming more qualification oriented in the area of specific computer skills. This trend could be both beneficial and cause problems, it needs to be controlled and defined.
- Economic recession does cause companies to reduced training budgets. However, sensible companies can take advantage of recession to re-skill for the future.

Exhibit VI-5 (continued)

Vendor Comments on Issues and Challenges in the Training Market

- Changing user cultures and organisational trends infer the need to sell one off training products rather than longer term training contracts.

- Although users do reduce budgets in times of recession they seem unaware that in the long term it is more costly not to continue training.

- The role of the training is changing. Whereas historically the trainer was a delivery vehicle, training now needs to focus on the needs of the users core business. Therefore, the role of the trainer will change from being a deliverer to a provider.

- The market in the UK is particularly difficut, there is no critical mass in any market sector on which to focus training and there is a wide range of user attitudes to training.

- A large amount of end user training is funded by end user budgets, not IT budgets.

- Decentralisation of IT functions and organisation is fragmenting the training market.

- Difficulties in obtaining prior information of new software releases delays the development of course-ware.

VII

Vendor Profiles

VII Vendor Profiles

This section of the study provides profiles on a selection of training vendors. Vendors included in this section are:

- Applied Learning International
- Digital
- EuroPace
- Hewlett Packard
- Integrata
- Learning Tree
- SD-Scicon
- Sphinx Level V

Other profiles may be added as data becomes available.

1. Applied Learning International

Applied Learning International is one of the leading providers of Technology Based Training (TBT) on a worldwide basis. The training delivery mode is via interactive terminals handling a variety of multimedia training products. Delivery to the customer is by courier from a warehouse inventory.

Applied Learning International was founded at the end of 1987 as a result of a merger between two companies, Advanced Systems Incorporated (ASI) and Deltak Training Corporation. Previously these two companies were competitors with each supplying training products and services, in part related products and services in part related to the implementation of information technology in user organisations.

The new company that was formed as a result of the merger, Applied Learning International, is a wholly owned subsidiary of National Education Corporation (NEC) who are based in California, USA. Applied Learning are the largest division of NEC, other divisions include:

- International Correspondence Schools (ICS).

- Steck-Vaughin; an educational publishing company

- Motivation Systems and Sales Training company

- Vocational schools;

Worldwide NEC achieved just over $370 million of revenue in 1990, and although this revenue indicates a progressive decline from almost $460 million in 1988 and a net loss for 1989 ($29 million approx) and 1990 ($15 million approx) these changes are explainable. A revenue decline of about $31 million between 1989 and 1990 is attributed to Applied Learning training and publishing revenues and is due to the introduction of new terms and conditions for customer contracts which result in shorter term contracts, and more closely matched revenue and cash receipts. The result of this change in contract terms is to reduce revenue from multiple year contracts.

A summary of the financial results of the parent company, NEC, is provided in Exhibit VII-1.

Exhibit VII-1

National Education Corporation Worldwide Five-Year Financial Summary

Year	1986	1987	1988	1989	1990
Net Revenue	$319,047	$396,163	$457,477	$400,828	$371,394
Net Income (Loss)	$15,191	$(679)	$46,147	$(29,341)	$(14,939)

Applied Learning is listed on the New York Stock Exchange under the name of National Education, the stock is a Capital Growth Fund whereby all profits are reinvested back into the company.

Applied Learning International is divided into two operational units, Domestic USA and International. The International division being responsible for all marketing and sales outside the USA, and the products are marketed in 50 countries through 70 offices. Representation in some countries is through independent distributors and all country level subsidiaries and distributors report to International. The International management team reside in the UK Head Office which is located in Chiswick on the outskirts of London. However, a number of International staff are also based in the Corporate Headquarters in Chicago USA. In addition to the management of the two operating divisions, a Corporate Executive Committee co-ordinates worldwide activities.

The UK company is the largest subsidiary of international.

The distribution of NEC revenues by geographic region is illustrated in Exhibit VII-2.

Exhibit VII-2

National Education Corporation Geographic Revenue Split

	Percentage of Revenue		
Geographic Region	1988	1989	1990
USA	80	81	83
Europe	12	12	9
Canada	5	5	5
Other Foreign	3	2	3
Total	100	100	100

All training products that are provided by Applied Learning are based on Technology Based Training (TBT) and are delivered as multi media packages designed to run on interactive terminals. The mediums used to achieve the delivery of training include:

- Computer-based training (Mainframe and Micro)
- Interactive Video Instruction
- CD-Rom
- Linear Videotape
- Audiotape

In cases where "live" training is required this function would be contracted out by Applied Learning.

The training provided focuses on five key areas:

- Information professionals; aimed at technology management. This is the core activity of Applied Learning and accounts for about 60% of their business in Western Europe. Within this area activities are mostly concerned with the mainframe environment and are designed to help customers use mission critical information technologies as strategic business tools, and they aim to provide the management skills needed to take full advantage of the systems. The scope of training ranges from programming to management skills and includes:
    - Strategic Uses of Computing
    - Information engineering
    - CASE tools
    - Artificial intelligence and expert systems
    - Client/Server model
    - Networks as a vital business link
    - Systems Applications Architecture
    - Relational database management systems
    - Managing strategic systems
- Departmental computing; aimed at information processing skills primarily for mid-range systems but also including mainframes. Programmes focus on both proprietary and open systems; provide for the skill needs of analysts, programmers and operations staff; and also range from entry-level to management positions. Included within the scope of this training is:
    - Entry level and programming
    - Systems analysis and design
    - Systems Application Architecture
    - MVS, VM, VSE, VS1
    - AS/400, System/36, System/38
    - Digital

  - UNIX
  - Database and fourth generation languages
  - DB2 and SQL
  - IMS and IDMS/R
  - Data communications and networks
  - CICS

- End user computing; aimed at providing courses to help people in all areas of an organisation to apply new technologies to achieve business goals. The courses can be customised to include training on data security, office automation and mainframe or microcomputer systems. Courses include:
  - Information centre overview
  - Computing fundamentals
  - Personal computing
  - Mainframe computing
  - Departmental computing
  - Office information systems

- Manufacturing; aimed at providing comprehensive training related to the acquisition of manufacturing and industrial skills. Courses are focused towards Modern Integrated Manufacturing (MIM) technologies, new technical skills and the people issues involved in MIM implementation. Courses include:
  - Total Quality Management (TQM)
  - Industrial skills
  - Just-in-time (JIT)
  - People, organisation and culture
  - MRP II
  - Computer Integrated Manufacturing (CIM)
  - Purchasing

Applied Learning also provides a range of human resource development courses.

The company is active throughout Western Europe and the revenues in this geographic region were about $45 million in 1990. The geographic breakdown of Applied Learning International revenues in Western Europe is tabulated in Exhibit VII-3.

Exhibit VII-3

Applied Learning International European Revenues by Geographic Region

	REVENUE ($ MILLIONS)		
GEOGRAPHIC REGION	1988	1989	1990
UK/EIRE[1]	28.6	30.4	31.3
BENELUX[1]	2.5	2.8	3.2
GERMANY[1]/ SWITZERLAND[2]/ AUSTRIA[1]	8.9	8.7	8.8
FRANCE/ITALY/[3] SPAIN/PORTUGAL	0.3	0.4	0.4
SCANDINAVIA/[2] FINLAND	0.6	0.8	0.9
TOTAL	40.9	43.1	44.6
ANNUAL GROWTH (PERCENT)	-	5.5%	3.5%

NOTES:
1. INDICATES SUBSIDIARIES
2. INDICATES DISTRIBUTORS
3. INDICATES AGENCIES.

The way in which the revenues of Applied Learning International are achieved can be segmented in a number of ways. This data is presented as follows:-

- Exhibit VII-4 provides a breakdown indicating the contribution by curriculum area attributed to the percentage of courswware for each area and the percentage of revenue derived from each area.

- Exhibits VII-5 and VII-6 provide an indication of the percentage of revenue achieved for each training delivery mode and the percentage of coursware activity related to each delivery mode.

Exhibit VII-4

Applied Learning International
European Activity and Revenue Contribution by Curriculum Area

CURRICULUM AREA		CONTRIBUTION (PERCENT)	
		COURSEWARE	REVENUE
INFORMATION PROFESSIONALS	MAINFRAME	48	58
	MIDRANGE	7	6
TECHNICAL MANAGEMENT		8	3
END USER		16	18
MANUFACTURING		9	1
HUMAN RESOURCE DEVELOPMENT		12	14
TOTAL		100	100

Exhibit VII-5

Applied Learning International
European Revenue Contribution by Delivery Medium

DELIVERY	COUNTRY MARKET REVENUE CONTRIBUTION (PERCENT)			
MEDIUM	UK	GERMANY	SCANDINAVIA	ITALY
LINEAR VIDEO	12	59	68	69
INTERACTIVE VIDEO	66	18	32	31
COMPUTER BASED TRAINING	18	12	-	-
CD-ROM	4	11	-	-
TOTAL	100	100	100	100

Exhibit VII-6

Applied Learning International European Activity Level By Delivery Medium

DELIVERY	COURSWARE ACTIVITY LEVEL (PERCENT)			
MEDIUM	UK	GERMANY	SCANDINAVIA	ITALY
LINEAR VIDEO	39	58	73	71
INTERACTIVE VIDEO	31	24	27	29
COMPUTER BASED TRAINING	27	10	-	-
CD-ROM	3	8	-	-
TOTAL	100	100	100	100

The two key issues raised by Applied Learning are:

- The pace of change within the IT industry as a whole including organisations and products/systems. The key challenge presented by this issue for Applied Learning is supporting the management of this change

- Implementation of workplace on-line tools and support. The key challenge for Applied Learning in this area is being able to provide reference information such that it supports user training needs.

Other issues raised by Applied Learning International related to their training activities in Europe include:

- The information services function within companies is becoming more decentralised. Therefore training needs throughout companies are becoming more fragmented. The challenge is how to extend the range of contacts from the original single contact in an organisation in order to handle and penetrate a fragmented organisation.

- Historically the company has sold one, three or five year training contracts. The mechanism by which this process works is that the customer would purchase a quantity of training units, which differ in size and value dependent on the size of the contract. The usage of these training units can be organised to suit the customer's needs during the contract period. An issue related to this business methodology is that when a user organisation decentralises the original single contact retains the training units available, rather than disperse them, in an attempt to retain control. The challenge for Applied Learning is how to manage the change from single-contract mode and the change in user working practices.

- New release levels of industry standard software, for example Lotus 123 create problems related to course development. Lack of prior knowledge concerning the final release level of software delays the course development process. The challenge is how to pre-empt these delays.

Applied Learning has found that industry recession does cause users to reduce or cancel training budgets. However, the company suggested that some users take a more sensible approach during recessionary periods by taking advantage of the recession to re-skill for the future. Further, Applied Learning believes that recession causes improvements in the focus users apply to business needs and that this factor can be beneficial in the long term.

2. Digital Education and Training Services

Digital offer a range of services to their users which are grouped under the generic heading of Digital Services. The scope of these services is grouped under four discrete headings:

- Consultancy Services
- Education and Training Services
- Support and Maintenance Services
- Project Services

With respect to education and training services Digital have invested both time and money in order to meet the needs of their users. For example, in the UK alone Digital have over 250 dedicate staff who are supported by 3,800 staff worldwide. Further, in 1990 the education and training resources in the UK supported the needs of 20,000 students from their customer base and a further 15,000 enrollments from their own workforce.

The education and training capability developed by Digital has placed them as a leader in this field in Western Europe. Digital claim to be not only a leader in the Europe market but also as a partner to their customer base by offering an extensive range services in employee development and training. The training services offered fall within three categories:

- DECtask
- DECdevelop
- DECtrain

In more detail these three categories of training product can be described as follows:

- DECtask; is a strategic level consultancy service aimed at assisting users to define and plan training needs that embrace the relationship between organisational requirements and operational procedures. Under this category of training Digital assist the user to assess current skill requirements that result from implementation of information technology. Also included is training and operation procedures to suite specific information technology solutions. Key features of DECtask include:
    - The availability of consultants to provide a report including assessment and analysis of existing user skills and the behaviourial profiles of the users' organisation.
    - Recommendations that will define the education or training solutions to ensure that the user will be capable of achieving effective use of the information technology solution implemented.
    - Recommendations made are claimed to be independent of the range of products and services available from Digital.
- DECdevelop; is intended to complement the existing off-the-shelf portfolio of training offerings by developing specific elements of training that may be needed to support user structured and business specific plans for training. Within the scope of this level of training Digital will customise training services to meet user needs to provide added value through the design phase, aimed at developing the most suitable curriculum for the user. The training provided is a mix of standard, customised or custom built courses together with the appropriate delivery media. The key features of DECdevelop include:
    - Access to the capabilities of Digital to design and build customised training products.
    - Access, dependent on region, to over 100 instructors and 80 course development experts together with a full range of support skills and resources.

  - Training capability also allows third party products and the users own applications to be included.
  - Facilities are available for the production of customised training support materials and all forms of support media.

- DECtrain; is aimed at providing an extensive range of training capability to cover options for both new and existing users through to technical professionals. Within this category over 250 courses are offered by Digital as standard scheduled courses covering Digital systems, open systems and third party products. Further the courses, that are either Digital or industry standard courses, are available in scheduled form or may be customised to suit individual user needs. The key features of DECtrain include:

  - UNIX and open systems
  - Digital operating systems
  - Programming and software engineering
  - DECtp
  - Networks and data communications
  - End user and office applications
  - Self-maintenance (on selected Digital hardware products)
  - Customer applications
  - Third-party applications
  - Management information
  - Management training in non-technical skills

The scope of the three categories of training offered by Digital is summarised by Exhibit VII-7.

Exhibit VII-7

Digital Training Services

	Scope			
Training Product	Plan	Design	Implement	Manage
DECdevelop	X	X	X	X
DECtask		X	X	X
DECtrain			X	X

As a market leader in the provision of training within Western Europe the training revenues of Digital are estimated at about $145 million in 1990. The extent of the training services provided by Digital covers the whole of Western Europe, the percentage of training revenues achieved in the various country markets is provided by Exhibit VII-8, almost 65% of these revenues being gained in the four larger country markets of France, Germany, the United Kingdom and Italy.

Exhibit VII-8

Digital
Western European
Education and Training Revenues 1990

Country Market	Percentage of Revenue
France	13.0
Germany	20.0
United Kingdom	21.0
Italy	9.0
Sweden	5.5
Denmark	2.0
Norway	2.0
Finland	2.5
Netherlands	8.5
Belgium	2.5
Switzerland	6.5
Austria	2.0
Spain	2.0
Rest of Europe	3.5
Total	100.0

3. EuroPACE

EuroPACE whilst recognising that their aims are ambitious also believe that they are realistic. The following statement states these aims.

"To help European Industry in its urgent need to stay competitive, by providing the most up to date knowledge relevant for research, development, manufacturing and management; using advanced information and communication technologies."

EuroPACE is a relatively unique organisation, believed to be the only organisation in its market niche in Europe using satallite communications as a delivery mode for education and training.

The success of EuroPACE is such that the organisation is currently delivering about 350 hours of new training material per year via the satellite link. In judging this success it is necessary to take into account that EuroPACE is primarily a "wholesaler" not a retailer; subscribers receiving the material record it and then disseminate it within their own organisations. Therefore, the actual quantity of training delivered to participants is many times larger than the initial quantity transmitted by the EuroPACE organisation. The common language is English.

EuroPACE is a venture set up in 1988 by a number of leading international companies who are sponsors of the organisation. These sponsors are listed in Exhibit VII-9.

Exhibit VII-9

EuroPACE Sponsors

- British Telecom
- Bull
- DEUS
- Digital
- Fundesco - Telefonica
- Fundetec
- Hewlett Packard
- IBM
- IRI
- NORIT
- Philips
- Thomson
- CRE
- SEFI

These sponsors are continuing to support the development of EuroPACE and currently about 70 organisations across Europe regularly receive and record broadcasts. However, as EuroPACE point out, many of the receiving organisations are in themselves consortia therefore the total number of receiving organisations is much higher.

EuroPACE headquarters are located in Paris and the organisation is registered as a French "Association" that members have to join. The organisation is not intended as a profit making entity. The Chairman of EuroPACE is M. Hubert Curien, the French Minister of Research and Technology and Professor, University Paris VI.

There are four categories of membership of EuroPACE:

- The first two cover small business and academic organisations for which the current membership fee starts at 11,000 ECU's per year (about $15,000)
- Active members for which the current membership fee starts at 38,500 ECU's per year (about $53,000). Active membership is for companies or consortia who wish to be involved in the future planning of EuroPACE, with rights to attend all programme advisory groups.
- Full sponsors, pay for membership of EuroPACE for a five year period which for the initial group ends at the end of 1992. All sponsors of the EuroPACE organisation are board members and the joining of new sponsors is permitted. They initially paid 180,000 ECU's per year (about $245,000) to set up the EuroPACE organisation. However, the annual sponsorship fee has now reduced to 120,000 ECU's (about $165,000).

The target market for EuroPACE is defined by them as the continuing education sector which they divide into the following sub-sectors:

- Early employment
- Settling down
- Mid-life
- Late employment

EuroPACE have targeted on the early employment group on the basis that this group is the most highly motivated and in terms of high technology topics is the group most in need of continuous updating. For this group it is assumed that companies will pay for the access to EuroPACE material.

The organisation reason further that for each sub-sector there are four motivational forces on which the learning process is dependant:

- Access
- Process
- Price
- Culture

The medium of satellite based communications is seen by EuroPACE as a delivery mode for video training that attacks two of the four motivational forces - access and price. EuroPACE aim to lower the price of training. Although the company initially targeted the group with the highest motivation, early employment, on the basis that this was the group most motivated to learn, they are now seeking ways of accessing other sectors in particular management. The actual term used was "easing" into other sectors.

EuroPACE research has indicated that the lowest level of motivation exists within the mid-life group. If this sector of their market is to be successfully accessed, the company culture needs to be right in order to create the right level of encouragement, both within the company organisation and within the individual.

The position that EuroPACE have taken on pricing is that it should be based on production cost. Production costs are relatively low, about 5000 ECU's per hour (about $6,900); therefore the potential cost to users is also relatively low providing that sufficient users subscribe. A further point made by EuroPACE is that the use of satellite communications as a delivery mode is very efficient. Using the satellite medium the staff head count is about 15 compared with a possible requirement for about 60 staff that would be needed to package material for daily delivery using more conventional means, i.e. mail or courier delivery, and it would increase as more receive sites were installed.

EuroPACE consider their business as "self service" learning, more selling a licence than selling a product. Subscribing members and sponsors who receive the material have the right to record and edit the material received for distribution with their own organisations. No limits are placed on this distribution provided it is within the defined organisation of member companies. Rights for resale of material can be negotiated with EuroPACE if desired.

Broadcasts are currently made via a Eutelsat 1 satellite which, although relatively low powered, provides a good coverage throughout Europe. Most receiving sites can be served by a 1.8 meter motorised dish costing between $1900 and $3800.

In commenting on the issues surrounding its service EuroPACE offered the following comments:

- The use of satellites aids the efficiency of delivery and EuroPACE is a vehicle delivering expertise, whose price does not depend on the number of students.

- Production methodology is a key issue. People misunderstand technology and the driving forces. Training is important - technology is less so.
- "Warm body" approach to training is less interactive than many people believe. Interactivity as a critical component part of training can be a misnomer.
- Training and its benefits needs to be marketed and sold. Additionally, major cultural changes are required to breakdown the barriers to extend training across a wide spectrum.
- From the point of view of EuroPACE there is a need to find experts both well known and unknown to support their programme.
- "Mass" market training at low cost is an opportunity for EuroPACE.
- With regard to culture it is very important that people are encouraged to learn, or that incentives are provided. Many companies do not yet have the right culture.

Currently the scope of material offered by EuroPACE extends beyond INPUT's definition of information services training. But those courses offered that do fall within the scope of this definition relate to the key topics listed in Exhibit VII-10.

Exhibit VII-10

EuroPACE Key Topic Areas

- Advanced manufacturing techniques
- Expert systems and artificial intelligence
- Micro electronics
- Software Engineering
- Telecommunications
- Technology management
- Information systems management

Examples of courses provided that relate to information services, to be broadcast in the year beginning September 1991 are:

- Case-based reasoning (6 hrs)
- Software Quality, Metrics and Testing (7 hrs)
- Safety-Critical Control Systems (12 hrs)
- Next generation data base systems (10 hrs)
- Video communications; coding compression and transmission (21 hrs)
- OSI conformance testing (10 hrs)
- Innovation Management (10 hrs)

There are a number of factors that differentiate the activities of EuroPACE from those of other companies who are delivering video tape related training products, these factors include:-

- Material is broadcast once only
- Subject material tends to be related to leading edge technologies
- EuroPACE conduct about twelve live broadcasts each year on "hot" topics. For example expert systems, EDI and quality.
- EuroPACE encourages a diverse use of the material broadcast, ie. copying, editing etc. to match client educational culture.
- EuroPACE commissions education and reportage then broadcasts the material. For example the recent Super-Computer Conference.

The company uses satallites for delivery of television programmes; surface mail for delivery of printed documents; and computer conferencing, telephones and faxes for communication and feed back.

4. Hewlett Packard Education and Training Services

Hewlett Packard provide a range of services in support of their end user base of installed computer equipment. One of these services is education and training as part of HP Professional Services, namely HP Education Services.

The Company has over 40 training centres world-wide staffed by dedicated resources and education professionals, and through these centres train over 50,000 students each year. Each centre offers a core curriculum on system basics, such as the MPE and UNIX operating systems taking students from basic through to advanced concepts. Most training courses provide extended periods of hands-on practical training.

Key approaches to training that have been adopted by Hewlett Packard include:

- Maintaining a low student to teacher ratio allowing a high degree of interaction and personalised instruction,
- Offering project management training for customers who want to support their own development activities,
- Programmes designed to train user instructor's enabling them to conduct in-house user courses. These courses being aimed at in-house applications training.

On these last two items, Hewlett Packard have recognised that many users have good in-house programming and technical capability but lack the necessary knowledge and educational skills to implement their applications company wide. To quote an example, Hewlett Packard refer to a user writing an order entry or inventory application being able to depend on them to design an appropriate education training programme to train user's instructors to teach an in-house course.

The future direction of Hewlett Packard focuses on three key areas:

- Business Systems and Office Application
- Engineering Systems
- Technical Computing

Also included is a curriculum path for UNIX (HP-UX) users.

Within each of the three key focus areas Hewlett Packard offer a wide range of training courses. For example under the heading of Business Systems and Office Applications the Company list 57 courses. These courses are also aimed at a number of levels including:

- System Operators
- System Managers
- Programmers
- Data Centre Managers
- Administrators

Within Western Europe Hewlett Packard list 16 HP Education Centres located in 13 countries as follows

- Austria
- Belgium
- Denmark
- United Kingdom (2)
- Finland
- France
- Italy
- Netherlands
- Norway
- Spain
- Sweden
- Switzerland (2)
- Germany (2)

Information services training revenues for Hewlett Packard in Western Europe are estimated at about $34 million in 1990. The proportioning of these revenues by country market is illustrated in Exhibit VII-11.

Exhibit VII-11

Hewlett Packard
Education and Training Revenues 1990

Country Market	Percentage of Revenue
France	17.5
Germany	18.5
United Kingdom	26.0
Italy	12.5
Sweden	2.0
Denmark	1.0
Norway	0.5
Finland	0.5
Netherlands	5.5
Belgium	2.0
Switzerland	2.5
Austria	2.0
Spain	9.0
Rest of Europe	0.5
TOTAL	100.0

5. Integrata

Integrata AG is a privately owned German company. The company was founded in 1964 by Dr Wolfgang Heilman. In 1989 the company changed its status from GmbH to AG and at the same time raised its capital base from DM 2 million to DM 4 million.

Currently Integrata employ about 520 staff, of which 135 have ownership of the company. There are no other shareholders.

The company has offices in Stuttgart, Hamburg, Munster, Frankfurt, Munich and a wholly owned subsidiary in Switzerland which was set up in September 1990. The company also has co-operative agreements with DVZ Leipzig GmbH and DVZ Berlin GmbH. These companies conduct Intregra's training operations within their respective geographic areas.

During 1990, co-operation agreements were signed with Hoskyns UK and SINDATA in Indonesia. At the beginning of 1991 Integrata established a subsidiary in Austria and have plans to open a subsidiary in Berlin during 1991.

Exhibit VII-12 provides a five year financial summary for Integrata.

Exhibit VII-12

INTEGRATA
FIVE YEAR FINANCIAL SUMMARY
($ Millions)

YEAR	1986	1987	1988	1989	1990
REVENUE	18.9	24.6	31.0	39.0	46.1
ANNUAL GROWTH RATE (%)	37	30	26	26	18

[Note:- Currency conversion by INPUT at $1 = DM 1.68]

Integrata is forecasting 1991 revenues at $55.4 millions (DM 93 Million) which represents an annual growth of 20% over 1990.

The key products and services offered by Integrata are as follows:

- Administrative Information Systems
- Technical Information Systems
- Software
- Programming
- Training

A breakdown of the revenue contribution by service or product delivery mode is provided by Exhibit VII-13

Exhibit VII-13

INTEGRATA - 1990 MARKET ANALYSIS BY SERVICE MODE (INTEGRATA CLASSIFICATION $ MILLIONS)

Service/Product Delivery Mode	Revenue	Percent
Consultancy	9.2	20
Software Department and Services	19.9	43
Standard Software	3.1	7
Training	13.9	30
Total	46.1	100

[Note: Currency conversion by INPUT at $1 = DM 1.68]

In their training brochures Integrata lists a choice of 337 courses or seminars ranging from 2 days to 5 weeks in duration. The training brochure is divided into three parts:

- 254 seminars aimed at technical professionals and programmers
- 83 PC seminars focussed more on the needs of end users
- An additional range of seminars under the heading Academy for Information Technology (A.F.I.). These courses leading to formal A.F.I. qualifications.

In 1990 Integrata claimed to have achieved a total of 89,000 participant training days.

The approach to training that has been adopted by Integrata is in two parts:

- The company claim to be a leading training provider in the German market and state "achieving a rational and approachable use of information technology" as a goal.
- A special feature of Integrata training is that all trainers are also consultants or managers and are therefore able to bring both practical experience and current issues into each training seminar. When working on projects, they impart their theoretical knowledge to the overall benefit of the project.

In positioning themselves as a full service training company Integrata offer the following services to their clients:

- Customised Seminar Development; where the training can be directly related to the customers individual needs and requirements. Seminars can be conducted either at the customers site or on Integrata premises.
- On the Job Training; in recognition that it is often a difficult task to put theory into practice trainers are available to provide assistance after a training course has finished and can also work on a customers project to provide additional assistance
- Follow-Up Training; further assistance and follow-up courses are prepared after researching the needs of individual customers
- Training Consultancy; allows customers to receive advice about which courses would be most beneficial to their company needs
- Facility Management; Integrata will provide the customer with access to a training manager who, for example, could spend 5 days per month working specifically for that customer. Work undertaken could include systematic planning, implementation and control of the customers DP training needs.
- Computer Based Training (CBT); is a service aimed at working closely with customers to provide an optimised CBT training solution.

Delivery of training is achieved through 10 branch offices in Germany, Integrata's wholly owned subsidiary in Switzerland and a branch office in Austria. Currently about 90% of training revenues are generated by activities in the German market.

A brief summary of the courses provided by Integrata is as follows:

- Technical Courses:
  - General courses; introductory courses for experts and DP users.
  - Methods, Techniques and CASE; including MENTOR (Integrata's Methods package, PROMPT, IEW and CASE.
  - Languages and Programming; including COBOL, MVS-DUMP, Assembler, C, and 4GL's.
  - DB/DC Systems; including ORACLE, Informix, ADABAS, CA-IDMS, DB2, SQL/DS, IMS and DL/1, and CICS.
  - Systems Software; including IBM (MVS, AS400), DEC (VMS and DECnet), Siemens (BS2000 and EDT), UNIX and Networks.
  - Information Systems; including office and administration information systems, Technical information systems (PPS, CIM), Manufacturer specific information systems (CON-NECT, DATATRIEVE, IBM Office Vision), SAP software, UNIPLEX.
  - Information Management; including data management and management information systems.
  - Management, Conduct and Communication.
- End-User Courses
  - Basics
  - Programming Languages
  - Operating Systems Users Interfaces
  - Networks, Communication
  - Office Communication
  - Word Processing
  - Data bases

- Academy for Information Technology (A.F.I.) courses
  - Junior Programmer - COBOL
  - PC Organiser
  - Data Processing Coordinator
  - Software Engineer/Analyst
  - Data Processing - Project Manager
  - Information Manager
  - DB2 - Applications Programmer
  - `C' Expert
  - UNIX Expert
  - OS/2 Expert
  - PC-User Qualification.

6. Learning Tree

Learning Tree is a privately owned company which claims to be a world leader in advanced technology education. The company's headquarters are located in Los Angeles, U.S.A. with operations covering, U.S.A., Canada, Western Europe and Japan.

Formed in 1974 Learning Tree now have a team of over 500 instructors presenting over 2000 training courses annually. In founding the company Dr David Collins and Eric Garen recognised a clear need for educating working engineers in computers, communications and related technologies. At the same time the founders decided to create a multinational company devoted to these tasks.

In identifying the benefits of Learning Tree education and training the company highlight the following attributes:

- High and rapid return on investment; the company claim that clients report an average productivity improvement of 27% following participation in their courses,
- Improved competitive position through reduced costs and increased productivity; the company claim that their instructors spend 80% of their time working within their own fields of activity and 20% sharing up to date knowledge with training course participants. By the use of this approach instructors can transfer the "best practices" based on many years of hands-on experience,
- A guarantee of satisfaction; After more than 1 million participant days of training Learning Tree feel that they can provide this guarantee with confidence. In backing up this level of confidence the company offer to refund the full training fee unless clients feel 100% satisfied.

The chronological history of the company can be summarised as follows:

- Founded 1974 in Los Angeles U.S.A.
- In 1975 the European headquarters were opened and the first courses presented in Japan.
- Between 1980-1981 Learning Tree were employed to train the entire IBM team that would be responsible for developing the IBM PC.
- In 1985 the Canadian centre opened in Ottawa.
- Between 1986-1989 the Company staffing levels grew to 500 world-wide and Company investment exceeded $5 million.
- In 1989 the Company name was changed to Learning Tree International and at this time the company completed delivery of 1 million participant days of training.
- In 1990 Learning Tree International KK was formed in Japan.

Within Western Europe the scope of training currently offered by Learning Tree is relatively wide ranging in that the courses available range from management training to microprocessors. The range of training courses available can be summarised as follows:

- Courses for Managers in Technical Environments; comprising 6 short courses each of 4 days duration costing about $2,100.
- Software Development and Project Management; comprising 9 short courses each of 4 days duration costing about $1,950.
- Networks, Data Communications and Telecommunications; comprising 9 short courses each of 4 days duration costing about $2,100.
- Hands-on courses on "C", UNIX and OS/2; comprising 9 short courses each of 4 days duration costing about $2,100.
- PC Trouble Shooting, Microprocessors, Signal Processing, Graphics and Signal Processing; comprising 6 short courses of 2-4 days duration costing between $1,200 and $2,100.

In presenting their view of key trends and issues related to the European training and education market Learning Tree highlight:

- The return on investment for both the user and the vendor is becoming increasingly important. From the users point of view, historically only a minority of organisations have attempted to measure the effectivity of training. However, now there is a trend towards more sophisticated systems for measuring productivity and efficiency gains. From the vendors perspective there is a need for improved methods of justifying the return on the training investment made by users.
- Resulting from pressure within organisations to reduce costs, there is an increasing need for users to justify expenditure on training and also to identify which skills are strategic to their organisation.
- There is an opportunity to develop and provide access to training through the medium of user applications. This can be achieved by integrating the design of training modules into the design of applications.
- Technical professionals, for example professional DP staff, will progressively need more training and be exposed to training on a wider range of subjects. This will specifically be related to:
    - Datacomms
    - Graphics
    - Fiber Optics
    - Image Processing
    - Networking
    - Software Engineering

Learning Tree are of the opinion that training is not necessarily the first item to suffer from budget cuts in times of recession, at least not at the more advanced level. The company, in commenting on the skills shortage suggested that this is, to a degree, due to the poor use that is made by users of existing skills.

However, the company feel that the key to market growth is the successful implementation of the measurement of training benefits - provided that the training is successfully implemented. Further that the growth of UNIX will be a major factor that will contribute to future growth.

The world-wide training revenues of Learning Tree are between $50 million and $60 million, of which about 50% is generated within Western Europe.

The make up of the Western Europe revenue base is illustrated in Exhibit VII-14.

Exhibit VII-14

Learning Tree Western Europe Revenues, 1990

Country Market Operation	Percentage of Revenue
France	35
Sweden	20
United Kingdom	45
TOTAL	100

It should be noted however that training revenues accredited to the United Kingdom includes a proportion of revenue that is attributed to the training of non-UK students. About 25% of the United Kingdom revenues occur as a result of these activities and relate to training for students from the Netherlands and Scandinavia (excluding Sweden).

7. SD-Scicon

SD-Scicon ranks among the leading independent software and services vendors in Western Europe with 1989 total revenues of about $550 million. The company employs 4,500 staff in eight European countries, including 2,500 in the United Kingdom.

Following a downturn in the Company's recent profit performance at the end of May 1991 SD-Scicon were faced with a potential takeover by Cray Electronics and also a bid by EDS. They now form part of EDS Euopean activities.

The major core activities of SD-Scicon comprise systems integration, consultancy, systems operations (FM) and advanced software products.

In support of the core business activities SD-Scicon provides a training service to its user base. In providing these services the company offer a comprehensive portfolio of training which is applicable to programmers, systems analysis and technical management. The focus of the training provided is based on the "Systems Life Cycle" and is oriented towards technical training.

SD-Scicon claim to be a major provider of training to both commercial and government market sectors. A substantial number of major contracts are claimed to have been won over the last year, including one in which SD-Scicon have become the exclusive trainer to the four nation European Fighter consortium in the Hood method, IPSYS Hood tool-set and XD Ada Cross Compiler.

Training can be provided at either the training centre located in Fleet, (Hampshire) in the United Kingdom and on site throughout Western Europe.

The systems and consultancy training portfolio offered by SD-Scicon can be summarised as follows:

- Methods; this section of the portfolio includes:
  - SSADM analysis and design
  - YOURDON (Ward & Mellor) SASD for real-time systems
  - Object oriented software development
  - HOOD method and HOOD IPSYS tool set
  - CORE requirements capture method
  - MASCOT and JSD design methods

- Languages; including
  - ADA Programming and design, plus EFA ADA Compilation System
  - C and C++
  - UNIX
- Project management;
  - PRINCE, the UK government standard for project management and control of IT projects
  - Risk management
  - Estimating
- Quality; aimed at people in the software design environment and the issues involved in the building of quality software and reducing defects.

In addition to the above courses that are aimed at technical training SD-Scicon also offer a range of more general courses focused on consultancy skills. Including, for example, writing skills, presentation skills, report writing and time management.

Two of the technical courses offered, SSADM Part 1 - Analysis and SSADM Part 2 - Design, lead to the UK Systems Analysis Examinations Board Certificate of Proficiency in SSADM. This qualification can be awarded for success in examinations following completion of both parts of the course. The course in total takes 9 days to complete.

The cost of SD-Scicon training courses ranges between about $380 for a one day overview to about $3,000 for both parts of the SSADM course including the examination.

The key factors that SD-Scicon see as influencing the training market are as follows:

- Economic recession can cause user companies to be reticent when approving training expenditure.
- An upsurge in training related to methods and project management aimed at improving both technical competence and disciplines.
- The need to move people for training is a key issue, the cost of travelling and accommodation can equal the cost of training courses. Additionally, user companies suffer loss of access to people while on training courses.
- Training needs to be more pro-active rather than reactive. One opportunity would be to implement embedded training within user applications.
- CBT has not yet developed to the extent where it can form an effective training medium. This approach can still form part of a training course but the most effective training aid remains the "warm body".

The 1990 training revenues of SD-Scicon, related to courses separately paid for, totalled about $875,000 and are expected to grow by about 10% to 12% in 1991. Derivation of the revenues by European country market is provided by Exhibit VII-15.

Exhibit VII-15

SD-Scicon Training Revenues, 1990

Country Market	Percentage of Training Revenue
United Kingdom	82
Sweden	6
Germany	6
Italy	6
Total	100

In addition to the revenue accrued outside the United Kingdom about $100,000 of the United Kingdom proportion relates to overseas courses that are revenued in the United Kingdom.

8. Sphinx-Level V

Sphinx-Level V are a specialist training company and are part of the Vistec group. The company was formed by a merger of the two companies each of whom had a firm foothold in the UNIX market place.

Vistec is a large dealer operating within the UK in the PC and PC applications market. Annual revenues are about $78 million.

Sphinx-Level V specialise in providing flexible training solutions covering UNIX/Xenix, Informix, Uniplex, Word Perfect, Open Systems Communication, C Programming and Project Management courses. The company operates primarily within the UK but will structure courses for the European mainland on request. At present only about 2% of training revenue is generated from outside the UK.

In addition Sphinx-Level five also provide a software distribution service which accounts for about 10% of revenues.

The reasons for the success of the company's training operation are claimed to result from two key elements:

- Meeting individual requirements within a professional learning environment. This factor includes a purpose built facility, located in Maidenhead in the UK, at which class sizes are kept small enough to allow individual attention but also allow student interaction, which the company feel is a valuable element of the learning process.
- Ensuring that the training provided is practical, a critical element of the effectiveness of training. Each student is provided with an individual terminal to ensure a hands-on element and the structure of the courses is designed to include a practical approach.

As an alternative to their training centre the company will also provide on-site training where the numbers of students involved is sufficiently large.

The range of courses offered by Sphinx include:

- The UNIX/Xenix suite
    - UNIX/Xenix Foundation
    - UNIX/Xenix Foundation and Bourne Shell
    - SCO UNIX Installation
    - Bourne Shell Programming
    - Xenix Installation
    - Xenix Administration
    - UNIX for DP Professionals
    - SCO Open Desktop Administration
    - SCO ODT Developers Workshop
    - UNIX Market Overview
- The Informix Suite
    - Introduction to Relational Databases
    - Informix - SQL Essentials
    - SQL for Database Administration
    - Informix - 4GL for SQL Users
    - Informix - 4GL Programming
    - Informix on-line programming
    - Informix on-line administration

- The Uniplex Suite
  - Uniplex word processing, plus and advanced course
  - Uniplex spreadsheets
  - Uniplex database forms
  - Uniplex structural Query Language
  - Uniplex advance office
  - Uniplex administration
  - Uniplex configuration
- The Word Perfect Suite
- The Communication Suite
  - Open Systems Communication Overview
  - TCP/IP and UNIX
  - X25 Overview and Workshop
- The Programming Suite
  - OSF Motif development
  - C Programming Essentials
  - Structural Query Language
  - Project Management Overview
  - Software Project Maintenance

The duration of courses lasts for between 1-5 days and typically prices range from about $380 for one-day course to $1,725 for the five day course.

In commenting on the key issues and trends in the training and education market Sphinx highlighted the following:

- There is a need for a public body to promote training and stimulate user interest, and if appropriate provide assistance with funding.
- It is sometimes difficult to achieve a balance between providing a training service that is profitable and funding the investment required for new courses.
- Training tends to be very much a reactive business rather than proactive and also training tends to be very much a project driven activity.
- Companies should focus training towards improving the effectiveness of existing skills rather than on training new employees. The reason for this opinion relates to the fact that new employees carry a higher risk factor.

Currently the training revenues of Sphinx are about $20 million, excluding revenues from software distribution. The apportionment of these revenues is equally divided, about one third each, between:

- UNIX
- Programming in UNIX
- End User Applications

Sphinx have recently started issuing licences to companies to start training centres in Germany and Yugoslavia.

Appendices

A Market Forecast Database

Exhibit A- 1

France
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—FF Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	875	955	1,040	1,130	1,240	1,350	1,470	9.0
Independent Software and Services Vendors	1,995	2,295	2,630	3,020	3,440	3,950	4,530	15.0
Total	2,870	3,250	3,670	4,150	4,680	5,300	6,000	13.0
Annual Growth (Percent)	-	13.0	13.0	13.0	13.0	13.0	13.0	-

Exhibit A- 2

Germany
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—DM Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	315	355	405	455	515	580	660	13.0
Independent Software and Services Vendors	515	615	705	845	985	1,170	1,370	17.0
Total	830	970	1,110	1,300	1,500	1,750	2,030	16.0
Annual Growth (Percent)	-	16.0	16.0	16.0	16.0	16.0	16.0	-

Exhibit A- 3

United Kingdom
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—£ Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	110	125	135	150	165	185	210	11.0
Independent Software and Services Vendors	105	115	130	145	165	185	215	13.0
Total	215	240	265	295	330	370	425	12.0
Annual Growth (Percent)	-	11.0	11.0	11.0	12.0	13.0	14.0	-

Exhibit A- 4

Italy
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—Lira Billions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	125	130	140	150	160	175	185	7.0
Independent Software and Services Vendors	95	120	145	175	210	250	300	20.0
Total	220	250	285	325	370	425	485	14.0
Annual Growth (Percent)	-	14.0	14.0	14.0	14.0	14.0	14.0	-

Exhibit A- 5

Sweden
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—SeK Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	255	295	345	405	470	540	620	16.0
Independent Software and Services Vendors	266	300	345	395	450	510	570	14.0
Total	515	595	690	800	920	1,050	1,190	15.0
Annual Growth (Percent)	-	16.0	16.0	16.0	15.0	14.0	13.0	-

Exhibit A- 6

Denmark
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—DK Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	140	160	185	210	240	270	310	14.0
Independent Software and Services Vendors	70	80	90	100	115	130	145	13.0
Total	210	240	275	310	355	400	455	14.0
Annual Growth (Percent)	-	14.0	14.0	14.0	14.0	14.0	14.0	-

Exhibit A- 7

Norway
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—NK Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	145	170	200	230	265	310	360	16.0
Independent Software and Services Vendors	95	110	125	145	165	190	220	15.0
Total	240	280	325	375	430	500	580	16.0
Annual Growth (Percent)	-	16.0	16.0	16.0	16.0	16.0	16.0	-

Exhibit A- 8

Finland
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—FM Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	90	100	110	120	130	145	155	10.0
Independent Software and Services Vendors	40	47	55	63	72	82	94	15.0
Total	130	147	165	183	202	227	249	11.0
Annual Growth (Percent)	-	13.0	12.0	11.0	10.0	10.0	10.0	-

Exhibit A- 9

The Netherlands
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—Dfl Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	90	100	110	125	140	155	175	12.0
Independent Software and Services Vendors	190	225	270	315	370	440	515	18.0
Total	280	325	380	440	510	595	690	16.0
Annual Growth (Percent)	-	16.0	16.0	16.0	16.0	16.0	16.0	-

Exhibit A-10

Belgium
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—BF Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	750	860	990	1,150	1,310	1,500	1,750	15.0
Independent Software and Services Vendors	1,110	1,340	1,610	1,950	2,290	2,800	3,250	19.0
Total	1,860	2,200	2,600	3,100	3,600	4,300	5,000	18.0
Annual Growth (Percent)	-	18.0	18.0	18.0	18.0	18.0	18.0	-

Exhibit A-11

Spain
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—Pta Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	4,300	5,100	6,000	7,100	8,400	9,800	11,300	17.0
Independent Software and Services Vendors	2,600	3,000	3,600	4,200	5,000	5,900	7,100	19.0
Total	6,900	8,100	9,600	11,300	13,400	15,700	18,400	18.0
Annual Growth (Percent)	-	18.0	18.0	18.0	18.0	17.5	17.0	-

Exhibit A-12

Switzerland
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—SF Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	65	75	90	105	125	145	170	18.0
Independent Software and Services Vendors	75	85	95	110	120	135	155	13.0
Total	140	160	185	215	245	280	325	15.0
Annual Growth (Percent)	-	15.0	15.0	15.0	15.0	15.0	15.0	-

Exhibit A-1 3

Austria
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—Sch Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	190	215	240	275	315	365	420	14.5
Independent Software and Services Vendors	230	265	300	345	395	445	520	14.5
Total	420	480	540	620	710	810	940	14.5
Annual Growth (Percent)	-	13.0	13.5	14.0	14.5	15.0	15.5	-

Exhibit A-1 4

Rest of Europe
Information Services Training Market Forecast, 1991-1996
Local Currency by Vendor Segment

Vendor	User Expenditure—$ Millions							CAGR 1991-1996 (Percent)
	1990	1991	1992	1993	1994	1995	1996	
Equipment Vendors	18	22	26	31	37	44	54	19.0
Independent Software and Services Vendors	5	6	7	8	10	12	14	18.0
Total	23	28	33	39	47	56	68	19.0
Annual Growth (Percent)	-	19.0	19.0	19.0	19.0	19.0	19.0	-

B Information Services Training - Market Forecast Reconciliation

Exhibit B-1

Information Services Training - Market Forecast Reconciliation

COUNTRY MARKET	1990 FORECAST OF 1991 MARKET	1991 FORECAST OF 1991 MARKET	CAGR FORECAST IN 1990 REPORT 1991-1196 (PERCENT)	CAGR FORECAST IN 1991 REPORT 1991-1996 (PERCENT)
FRANCE	3700 M FF	3250 M FF	22.0	13.0
GERMANY	1020 M DM	970 M DM	19.0	16.0
UNITED KINGDOM	270 M £	240 M £	23.0	12.0
ITALY	290 B LIRA	250 B LIRA	25.0	14.0
SWEDEN	630 M Sek	595 M Sek	21.0	15.0
DENMARK	140 M DK	240 M DK	21.0	14.0
NORWAY	125 M NK	280 M NK	19.0	16.0
FINLAND	80 M FM	147 M FM	21.0	11.0
NETHERLANDS	350 M Dfl	325 M Dfl	23.0	16.0
BELGIUM	2300 M BF	2200 M BF	22.0	18.0
SPAIN	8820 M PTA	8100 M PTA	26.0	18.0
SWITZERLAND	180 M SF	160 M SF	23.0	15.0
AUSTRIA	530 M Sch	480 M Sch	23.0	14.5
REST OF EUROPE	23 M $	28 M $	25.0	19.0

C Economic Assumptions

There follow some notes on the methodology INPUT use in making forecasts and judging of how reasonable they are.

INPUT reports are based principally on three strands of research activity conducted throughout the year:

- A vendor research programme with more than 300 interviews with prominent software and services vendors across Europe. This research assesses their attributable revenues in each country by delivery made and, where possible by industry sector. INPUT consultants use their own judgement in many cases to categorise revenues into sub-sectors. In particular INPUT excludes revenues considered captive, such as those from a vendor's parent company.

- Several hundred vendor and user interviews across all European market sectors to determine trends and opinions. These interviews are part of the research that INPUT carries out in specific sectors of the software and services market. In 1990 for example INPUT produced reports on over 20 different software and services market sectors.

- Additionally INPUT maintains an extensive library and data-base of information relating to the software and services industry. This covers for example INPUT's customer services programme data: results of INPUT's research into the hardware maintenance market which includes its diversification into the software and services market.

All the forecasts from these activities are produced in local currency for each country, then consolidated with common economic and exchange rate data to produce a top level forecast. This is done for software and services in each country and in Europe as a whole. At each stage it is examined for reasonableness and consistency and if necessary revisited. For example we satisfactorily tested the question: Will predicted user budgets for information systems support the predicted high growth rates in software and services?

The forecasts also benefit from assignments for and feedback from INPUT clients, who include over 100 of the leading vendors of software and services around the world. For example: INPUT supplied an economic model to a market leading client on the potential effect of rising oil prices on forecast software and services growth rates. In summary this showed that falling real growth was largely counterbalanced by increases in inflation, resulting in continued high dollar growth forecasts for the market.

In order to consolidate INPUT's forecasts and vendor data into a consistent set of European analyses each year, it is essential to use a standard set of economic factors. The following pages show the inflation and exchange rates currently in use.

A
European Exchange Rates

The following table, Exhibit C-1, shows the standard exchange rates used throughout the 1991 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

Exhibit C-1

US Dollar and ECU Exchange Rates 1991

Country	Currency	US Dollar Exchange Rate	ECU Exchange Rate
France	FF	5.65	7.74
Germany	DM	1.68	2.30
United Kingdom		0.515	0.704
Italy	Lira	1,233.0	1,689.0
Sweden	Sek	5.61	7.69
Denmark	DK	6.39	8.75
Norway	NK	6.49	8.89
Finland	FM	3.96	5.43
Netherlands	Dfl	1.69	2.32
Belgium	BF	34.60	47.40
Switzerland	SF	1.27	1.74
Austria	Sch	11.80	16.17
Spain	Ptas	95.0	130.12
	$	1	1.37

Source: Barclays Bank (Q4 1990)

Exhibit C-2 shows the standard exchange rates used throughout the 1990 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

Exhibit C-2

US Dollar and ECU Exchange Rates
1990

Country	Currency	US Dollar Exchange Rate	ECU Exchange Rate
France	FF	6.17	6.87
Germany	DM	1.81	2.05
United Kingdom		0.631	0.74
Italy	Lira	1,336	1,502
Sweden	Sek	6.39	7.41
Denmark	DK	7.05	7.8
Norway	NK	6.85	7.94
Finland	FM	4.21	4.84
Netherlands	Dfl	2.05	2.3
Belgium	BF	38.06	42.29
Switzerland	SF	1.61	1.8
Austria	Sch	12.77	14.39
Spain	Ptas	115.8	129.7
	$	1	1.20

Sources: Exchange rates - Barclays Bank (1989)

B
European Inflation Rates

Exhibit C-3 shows the average five-year inflation assumptions for each reported country and the changes from those used in reports produced in the previous year. All INPUT forecasts include the effects of inflation as well as natural market growth rates. For consistency, the same inflation rates are used throughout all the different market sector research and analysis during a calendar year, unless specified otherwise.

Exhibit C-3

Inflation Assumptions 1990 and 1991

Country	Assumption 1990-1995	Assumption 1991-1996	Change
France	4.5	3.0	-1.5
Germany	4	2.7	-1.3
United Kingdom	7	4.8	-2.2
Italy	7	4.4	-2.6
Sweden	7	6.3	-0.7
Denmark	5	2.7	-2.3
Norway	5	4.9	-0.1
Finland	6	5.0	-1.0
Netherlands	3	2.4	-0.6
Belgium	4	3.3	-0.7
Switzerland	5	3.3	-1.7
Austria	4	2.6	-1.3
Spain	6.5	4.7	-1.8
Rest of Europe	10	7.7	-2.5
European Average	5.5	4.0	-1.5

Sources: OECD 1991 Forecast

IMF 1989

Exhibit C-4 shows the inflation assumptions for both the 1989 and 1990 research programmes.

Exhibit C-4

Inflation Assumptions 1989 and 1990

Country	Assumption 1989-1994	Assumption 1990-1995	Change
France	4	4.5	+0.5
Germany	2.5	4	+1.5
United Kingdom	5.5	7	+1.5
Italy	6	7	+1.0
Sweden	6	7	+1.0
Denmark	6	5	-1.0
Norway	4	5	+1.0
Finland	6	6	0.0
Netherlands	2	3	+1.0
Belgium	3.5	4	+0.5
Switzerland	2.5	5	+2.5
Austria	3	4	+1.0
Spain	5.5	6.5	+1.0
Rest of Europe	8	10	+2.0
European Average	4.5	5.5	+1.0

Source: IMF 1989

D Definition of Terms

A
Overall Definitions and Analytical Framework

Information Services - Computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Processing of specific applications using vendor-provided systems (called **Processing Services**)
- A combination of hardware, packaged software and associated support services which will meet a specific application processing need (called **Turnkey Systems**)
- Packaged software (called **Software Products**)
- People services that support users in developing and operating their own information systems (called **Professional Services**)
- Bundled combinations of products and services where the vendor assumes responsibility for the development of a custom solution to an information system problem (called **Systems Integration**)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called **Systems Operations**)
- Services associated with the delivery of information in electronic form-typically network-oriented services such as value-added networks, electronic mail and document interchange, on-line data bases, on-line news and data feeds, videotex, etc. (called **Network Services**)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is bundled as part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., EDI or VAN services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the **Information Services Industry** consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels, and competitive issues.

All **Information Services Market** forecasts are estimates of **User Expenditures** for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for re-packaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Market Sectors or markets, are groupings or categories of the users who purchase information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc.
- *Functional Application* markets, such as Human Resources, Accounting, etc. These are also called "Cross-Industry" markets.
- *Generic* markets, which are neither industry- nor application-specific, such as the market for systems software.

Specific market sectors used by INPUT are defined in Section D, below.

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors which have a different parent corporation than the user. It is these expenditures which constitute the information services market.

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the eight delivery modes defined by INPUT, five are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*

The remaining three delivery modes represent combinations of these products and services, bundled together with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section B describes the delivery modes and their structure in more detail.

Outsourcing is defined as the contracting of information systems (IS) functions to outside vendors. Outsourcing should be viewed as the opposite of *insourcing*: anything that IS management has considered feasible to do internally (e.g., data centre operations, applications development and maintenance, network management, training, etc.) is a potential candidate for outsourcing.

IS has always bought systems software, as it is infeasible for companies to develop it internally. However, all other delivery modes represent functions or products that IS management could choose to perform or develop in-house. Viewed this way, outsourcing is the result of a make-or-buy decision, and the outsourcing market covers any product or service where the vendor must compete against the client firm's own internal resources.

B

Industry Structure and Delivery Modes

1. Service Categories

The following Exhibit D-1 presents the structure of the information services industry. Several of the delivery modes can be grouped into higher-level **Service Categories,** based on the kind of problem the user needs to solve. These categories are:

- **Business Application Solutions (BAS)** - prepackaged or standard solutions to common business applications. These applications can be either industry-specific (e.g., mortgage loan processing for a bank), cross-industry (e.g., payroll processing), or generic (e.g., utility timesharing). In general, BAS services involve minimal customization by the vendor, and allow the user to handle a specific business application without having to develop or acquire a custom system or system resources. The following delivery modes are included under BAS:
    - *Processing Services*
    - *Applications Software Products*
    - *Turnkey Systems*

- **Systems Management Services (SMS)** - services which assist users in developing systems or operating/managing the information systems function. Two key elements of SMS are the customization of the service to each individual user and/or project, and the potential for the vendor to assume significant responsibility for management of at least a portion of the user's information systems function. The following delivery modes are included under SMS (research on these sectors is published in the Systems Management Programme):

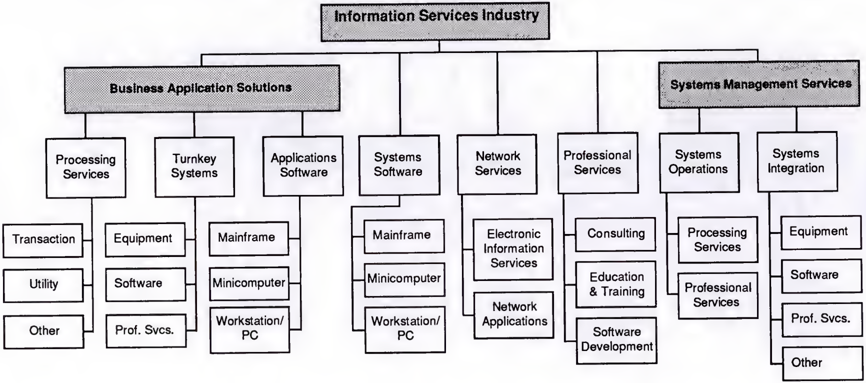
  - *Systems Operations*
  - *Systems Integration*

Each of the remaining three delivery modes represents a separate service category:

- *Professional Services*
- *Network Services*
- *System Software Products*

Exhibit D-1

Information Services Industry Structure



2. Software Products

There are many similarities between the applications and systems software delivery modes. Both involve user purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if bundled in the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the category of professional services. Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself.

- **Systems Software Products**

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. These products include:

  - *Systems Control Products* - Software programs that function during application program execution to manage computer system resources and control the execution of the application program. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

  - *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

  - *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids. Also included are system utilities (e.g., sorts) which are directly invoked by an applications program.

- **Application Software Products**

  - *Industry-Specific Application Software Products* - Software products that perform functions related to solving business or organizational needs unique to a specific vertical market and sold to that market only. Examples include demand deposit accounting, MRPII, medical recordkeeping, automobile dealer parts inventory, etc.

- *Cross-Industry Application Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Applications include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

3. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application software into a single system developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and support services provided. Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually application software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services.

Turnkey systems are divided into two categories.

- *Industry-Specific Systems* - systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical recordkeeping, or discrete manufacturing control systems.
- *Cross-Industry Systems* - systems that provide a specific function that is applicable to a wide range of industry sectors, such as financial planning systems, payroll systems, or personnel management systems.

4. Processing Services

This category includes transaction processing, utility processing, and other processing services.

- *Transaction Processing:* - Client uses vendor-provided information systems-including hardware, software and/or data networks-at vendor site or customer site, to process transactions and update client data bases. Transactions may be entered in one of four modes:

  - *Interactive* - Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation: the user is on-line to the programs/files stored on the vendor's system.

  - *Remote Batch* - Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.

  - *Distributed Services* - Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central systems for processing other parts of the application.

  - *Carry-in Batch* - Where users physically deliver work to a processing services vendor.

- *Utility Processing*: Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and or data bases, enabling clients to develop their own programs or process data on vendor's system.

- *Other Processing Services*: Vendor provides services-usually at vendor site-such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

5. Systems Operations

Systems operations involves the operation and management of all or a significant part of the user's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes:

- *Professional Services:* The vendor provides personnel to operate client-supplied equipment. Prior to 1990, this was a submode of the Professional Services delivery mode.

- *Processing Services:* The vendor provides personnel, equipment and (optionally) facilities. Prior to 1990, this was a submode of the Processing Services delivery mode.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the user's information systems (equipment, networks, systems and/or application software), either at the client's site or the vendor's site. Systems operations can also be referred to as "resource management" or "facilities management."

There are two general levels of systems operations:

- *Platform/network operations* - where the vendor operates the computer system and/or network without taking responsibility for the applications
- *Application operations* - where the vendor takes responsibility for the complete system, including equipment, associated telecommunications networks, and applications software

Note: Systems Operations is a relatively new delivery mode introduced in the 1990 Systems Management Programme - Europe. It was created by taking the Systems Operations submode out of both Processing Services and Professional Services. No other change has been made to the delivery mode definitions, and the total forecast expenditures for these three delivery modes are identical to the total forecast expenditures of the two original modes before the breakout of Systems Operations.

6. Systems Integration (SI)

Systems Integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of cost must be associated with information systems products and/or services. The SI sector is fully analysed and reported in INPUT's Systems Management Programme.

The systems integrator will perform, or manage others who perform, most or all of the following functions:

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed systems design and architecture
- System component selection, modification, integration and customization
- Custom software design and development
- Custom hardware design and development
- Systems implementation, including testing, conversion and post-implementation evaluation and tuning
- Life cycle support, including
  - System documentation and user training
  - Systems operations during development
  - Systems maintenance
- Financing

7. Professional Services

This category includes consulting, education and training, and software development.

- *Consulting:* Services include management consulting (related to information systems), information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of information systems, including equipment, software, networks and systems operations.

- *Education and Training:* Products and services related to information systems and services for the professional and end user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

8. Network Services

Network services typically include a wide variety of network-based functions and operations. Their common thread is that most of these functions could not be performed without network involvement. Network services is divided into two major segments: *Electronic Information Services,* which involve selling information to the user, and *Network Applications,* which involve providing some form of enhanced transport service in support of a user's information processing needs.

- *Electronic Information Services*

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers. Users typically inquire into and extract information from the data bases. Although users may load extracted data into their own computer systems, the electronic information vendor provides no data processing or manipulation capability and the users cannot update the vendor's data bases.

The two kinds of electronic information services are:

  - *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

  - *News Services* - Unstructured, primarily textual information on people, companies, events, etc.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

- *Network Applications*
  - *Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

INPUT's market definition covers VAN services only, but includes the VAN revenues of all types of carriers.

  - *Electronic Data Interchange (EDI)* - Application-to-application exchange of standardized business documents between trade partners or facilitators. This exchange is commonly performed using VAN services. Specialized translation software is typically employed to convert data from organizations' internal file formats to EDI interchange standards; this software may be provided as part of the VAN service, or may be resident on the organization's own computers.

  - *Electronic Information Exchange (EIE)* - Also known as Electronic Mail (E-Mail), EIE involves the transmission of messages across an electronic network managed by a services vendor, including facsimile transmission (FAX), voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

  - *Other Network Services* - This segment contains videotex and pure network management services. Videotex is actually more a delivery mode than an application. Its prime focus is on the individual as a consumer or in business. These services provide interactive access to data bases and offer the inquirer the capability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, and more.

Network management services included here must involve the vendor's network and network management systems as well as people. People-only services, or services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in Systems Operations.

Network Services research is fully reported in INPUT's Network Services Programme.

C
Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues, and user expenditures. While the primary data for INPUT's research is vendor interviews, INPUT defines and forecasts the information services market in terms of end-user expenditures. End-user expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels, such as original equipment manufacturers (OEMs), retailers and distributors. The focus on end-user expenditure also eliminates the double counting of revenues which would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., BusinessLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some significant areas of difference. Many microcomputer software products, for example, are marketed through indirect distribution channels. To capture the valued added through these indirect distribution channels, adjustment factors which incorporate industry discount ratios are used to convert estimated information services vendor revenues to end-user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems which they sell to end users.

D
Sector Definitions and Delivery Mode Reporting

1. Industry Sector Definitions (Vertical Markets)

INPUT has structured the information services market into 16 generic industry sectors, five of these sectors are the subject of specific INPUT research studies. These five sectors are discrete and process manufacturing, distribution, banking and finance and insurance. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) Code system. The specific industries (and their SIC Codes) included under these generic industry sectors are detailed in the following tables.

Sector:	Discrete Manufacturing
SIC Code	Market sub-sector description
23XX	Apparel and other finished products
25XX	Furniture and fixtures
27XX	Printing, publishing and allied industries
31XX	Leather goods
34XX	Fabricated metal products except machines
35XX	Industrial and commercial machines and computer
36XX	Electronic and electrical equipment except computer
37XX	Transportation equipment
38XX	Instruments; photo/med/opt goods; watches/clocks
39XX	Miscellaneous

Sector:	Process Manufacturing
10XX	Metal mining
12XX	Coal mining
13XX	Oil and gas extraction
14XX	Mining non-metalic minerals
20XX	Food products
21XX	Tobacco products
22XX	Textile mill products
24XX	Lumber and wood products except furniture
26XX	Paper and allied products
28XX	Chemicals and allied products
29XX	Petroleum refined and related industries
30XX	Rubber and miscellaneous plastic products
32XX	Stone, clay, glass and concrete products
33XX	Primary metal industries

Sector:	Distribution
SIC Code	Market sub-sector description
50XX	Wholesale trade - durable goods
51XX	Wholesale trade - nondurable goods
52XX	Retail - building materials
53XX	Retail - general merchandise stores
54XX	Retail - food stores
55XX	Retail - automotive dealers, gas stations
56XX	Retail - apparel and accessory stores
57XX	Retail - home furniture, furnishings and accessories
58XX	Retail - eating and drinking places
59XX	Retail - miscellaneous

Sector:	Banking and Finance
60XX	Depository institutions
61XX	Nondepository institutions
62XX	Security and commodity brokers, dealers and exchanges
67XX	Holding and other investment offices

Sector:	Insurance
63XX 64XX	Insurance carriers Insurance agents,brokers and services
SIC Code	Other Sectors
	Miscellaneous Industries:
01XX 02XX 07XX 08XX 09XX 15XX 16XX 17XX	Agricultural production - crops Agricultural production - livestock Agricultural services Forestry Fishing, hunting and trapping Building construction - general contractors Heavy construction - contractors Construction - special trade contractors
	Transportation Services:
40XX 41XX 42XX 43XX 44XX 45XX 46XX 47XX	Rail transport Public transit/transport Motor freight transport/warehousing Postal services Water transportation Air transportation except airline reservation Pipelines except natural gas Transportation services except travel agents
	Utilities:
49XX	Electric, gas and sanitary services
48XX	Telecommunications
80XX	Health services
82XX	Educational services
	Business and Technical Services:
65XX 73XX 81XX 87XX 89XX	Real estate Business services Legal services Engineering, accounting, research, management services Miscellaneous services
9XXX	Government
	Personal/Consumer Services:
4512X 472X 70XX 72XX 7389X 75XX 76XX 78XX 79XX 83XX 84XX 86XX 88XX	Airline reservation services Travel agents Hotels, rooming houses, camps and lodgings Personal services Hotel reservation services Automotive repair services and parking Miscellaneous repair services Motion pictures Amusement and recreation services Social services Museums, art galleries and botanical gardens Membership organisations Private households

2. Cross-Industry Sector Definitions (Horizontal Markets)

In addition to these vertical industry sectors, INPUT has also identified seven cross-industry or horizontal market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry. The seven cross-industry markets are:

- *Human Resource Systems*
- *Education and Training*
- *Office Systems*
- *Accounting Systems*
- *Engineering and Scientific Applications*
- *Planning and Analysis Systems*
- *Other Applications (including telemarketing, sales management and electronic publishing)*